SERVICE MANUAL
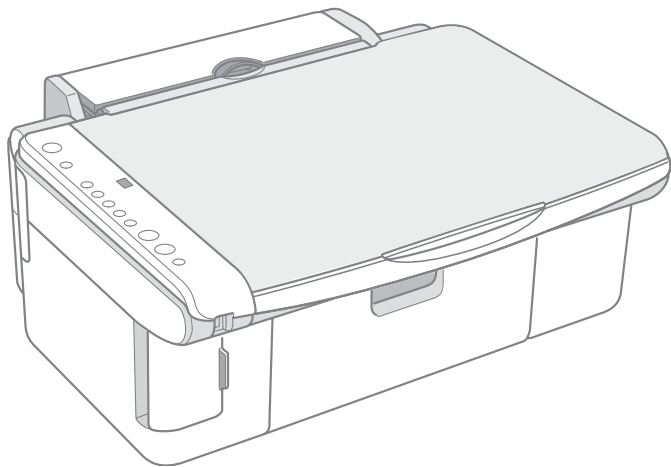
Color Inkjet Printer

EPSON Stylus CX4100/CX4200/CX4700/ CX4800/DX4200/DX4800/DX4850

EPSON

Notice:

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER   Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING   Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.

2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.

3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

4. WHEN DISASSEMBLING OR ASSEMBLING A PRODUCT, MAKE SURE TO WEAR GLOVES TO AVOID INJURIER FROM METAL PARTS WITH SHARP EDGES.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.

2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.

3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.

4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NON-APPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

6. WHEN USING COMPRESSED AIR PRODUCTS; SUCH AS AIR DUSTER, FOR CLEANING DURING REPAIR AND MAINTENANCE, THE USE OF SUCH PRODUCTS CONTAINING FLAMMABLE GAS IS PROHIBITED.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Manual Configuration

This manual consists of six chapters and Appendix.

CHAPTER 1.   PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2.   OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3.   TROUBLESHOOTING
Describes the step-by-step procedures for the troubleshooting.

CHAPTER 4.   DISASSEMBLY / ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5.   ADJUSTMENT
Provides Epson-approved methods for adjustment.

CHAPTER 6.   MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

CHAPTER 7.   APPENDIX
Provides the following additional information for reference:
• Connector Summary
• Exploded Diagram
• Parts List
• Electrical Circuits

Symbols Used in this Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read NOTE, CAUTION, or WARNING messages.

ADJUSTMENT REQUIRED — Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

CAUTION — Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

CHECK POINT — May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

WARNING — I.ndicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

REASSEMBLY — Indicates that a particular task must be carried out according to a certain standard after disassembly and before re-assembly, otherwise the quality of the components in question may be adversely affected.

Revision Status

Revision	Issued Date	Description
A	Aug 10, 2005	First Release

NOTE: *Any illustrations or photos of the printer without a card slot are based on the Stylus CX4100/CX4200/DX4200.*

Contents

Chapter 6 MAINTENANCE

Chapter 7 APPENDIX

C H A P T E R

1

PRODUCT DESCRIPTION

1.1 Overview

This unit features 4-in-1 functionality (computer-connected printer and scanner, stand-alone copy machine, and stand-alone memory card printing*) and is designed for home/personal use. Its main functions are described below.

Note "*": Only for CX4700/CX4800/DX4800/DX4850.

1.1.1 Features

☐ Printer functions
As a printer, this unit achieves high-quality output at high speed on plain paper, and uses new pigment ink for improved light fastness, water fastness, gas fastness, rubbing fastness. It includes the following features.

- ■ Maximum print resolution: 2880 (H) x 1440 (V) dpi

- ■ Separate ink cartridge for each color

- ■ ASF (Auto Sheet Feeder) holds up to 100 cut sheets (64 g/m^2)

- ■ Border-free printing with EPSON specialty media

- ■ Reduced noise level

- ■ Fast and thick draft mode with the combination of real black and composite black

☐ Scanner functions
Use of a CIS sensor means no warm-up period is required, which makes scanning more convenient and allows for a more compact scanner.
Additional features include the following.

- ■ Maximum optical resolution: 1200 x 2400 dpi

- ■ Scan gradations: 48 bits (input), 24 bits (output)

☐ Stand-alone copy functions
It benefits from using a more recently developed type of ink which enables photo-quality copies to be made not only on special media but even on plain paper. Only the basic copy functions are provided for easier operation.

- ■ Paper size can be selected from two options.

Table 1-1. Paper Size

Paper size	Model
Letter/4"x6"	Stylus CX4200, CX4800
A4/10x15	Stylus CX4100/CX4700/DX4200/DX4800/DX4850

- ■ Paper type can be selected from two options; plain paper or photo paper, which also defines copy quality.

- ■ Enlarge / Reduce factor can be selected from two options; actual size (100%) or "Fit to page".

- ■ Copy margin is automatically selected from three options, related to paper type and paper size; 3mm, "Small Margins Copy", or "Border Free Copy".

- ■ Fast and thick draft mode with the combination of real black and composite black

- ■ Copy functions can be directly alternated from memory card print functions, by operation panel. (Only for CX4700/CX4800/DX4800/DX4850.)

☐ Card reader functions (Only for CX4700/CX4800/DX4800/DX4850.)
This unit includes memory card slots that support CompactFlash, SmartMedia, Memory Stick, Memory Stick PRO, Micro Drive, SD Memory Card, and xD-Picture Card standards.

☐ Memory card print functions (Only for CX4700/CX4800/DX4800/DX4850)
This unit can print images from the memory card in memory card slots in stand-alone mode.
The memory card print features are as follows.

- ■ Supports "Index sheet printing" whereby images can be selected simply by marking an index sheet. Selecting images is easy-just check the desired images and then scan the index sheet.

- ■ Memory card print functions can be directly alternated from copy functions, by operation panel.

□ Scan functions
This unit provides scan mode so that data can be scanned and transferred to a connected computer or to e-mail via application software like the EPSON SMART PANEL.

□ Simultaneous use of functions
Printer functions and scanner functions are independent and can therefore be operated simultaneously from a connected computer.

□ Easy operation panel
The unit has a simple operation panel equipped with ten buttons* including power button, LEDs that contain seven segment LED and provides basic functions only for easy operation.

Note "*": Only for CX4700/CX4800/DX4800/DX4850.
            (9 buttons for the model without card slot)

□ Exterior design
Use of a CIS scanner engine has enabled a more compact design.
Also, this unit has operation panel on the left side, which becomes more distinctive but still easier to use.
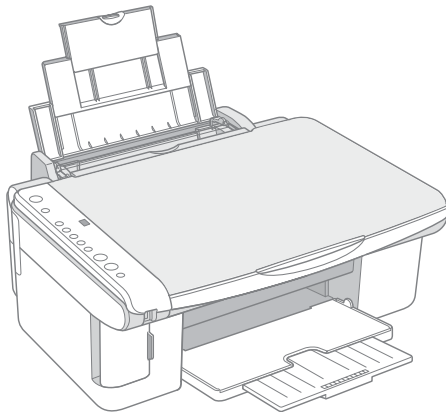
Figure 1-1. External View

1.2 Specifications

1.2.1 Printer specifications

This section covers specifications of the printer.

1.2.1.1 Physical Specification

☐ Weight

■ 6.8 kg (without the ink cartridges)

☐ Dimension (Including rubber feet, excluding loading tray)

■ 430 mm (W) x 354 mm (D) x 181 mm (H)

1.2.1.2 Printing Specification

☐ Print Method

■ On demand ink jet

☐ Nozzle Configuration

■ Monochrome 90 nozzles

■ Color 90 nozzles x 3 (Cyan, Magenta, Yellow)
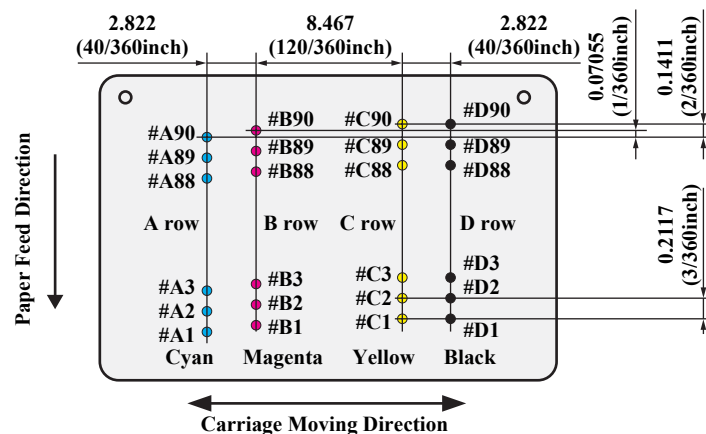
Figure 1-2. Nozzle configuration

☐ Print Direction

■ Bi-directional minimum distance printing (with logic seeking)

☐ Print Resolution

Table 1-2. Print Resolution

Horizontal direction (across columns)	Vertical direction (paper feed)
360 dpi	120 dpi
360 dpi	360 dpi
360 dpi	720 dpi
720 dpi	720 dpi
1440 dpi	720 dpi
1440 dpi*	1440 dpi*
5760 dpi*	1440 dpi*

Note "*": Those resolution can only be used with the printer driver.

☐ Print Speed & Printable Columns

Table 1-3. Character Mode

Character pitch	Printable columns	CR speed
10 CPI (Pica)	80	185 CPS*

Note "*": CPS: Characters/Second
This speed is when using normal dot printing mode.

Table 1-4. Graphics Mode (Standard)

Horizontal resolution	Printable area	Max. dot count	CR speed
360 dpi*	209.8 mm (8.26")	2976	360 cps
360 dpi	209.8 mm (8.26")	2976	285 cps
720 dpi	209.8 mm (8.26")	5952	220 cps
1440 dpi	209.8 mm (8.26")	11904	285 cps
2880 dpi	209.8 mm (8.26")	23808	285 cps

Note "*": Draft Printing

Table 1-5. Graphics Mode (Border-free Printing)

Horizontal resolution	Printable area	Max. dot count	CR speed
360 dpi*	215.05 mm (8.46")	3048	285 cps
720 dpi	215.05 mm (8.46")	6096	220 cps
1440 dpi	215.05 mm (8.46")	12192	285 cps
2880 dpi	215.05 mm (8.46")	24384	285 cps

Note "*": Except Draft Printing

☐ Control Code

■ ESC/P Raster command

■ EPSON Remote command

■ ESC/P-R Level-1 command

☐ Internal fonts

■ Character code: Alphanumeric with expanded graphics (PC437)
ASCII, 20H to 7FH only

■ Fonts: EPSON original fonts
Alphanumeric font: Courier

☐ Input buffer size

■ 64 Kbytes

1.2.1.3 Paper Feed Specifications

☐ Paper feed method
Friction feed, using one ASF (Auto Sheet Feeder)

☐ Paper path
Top feed, front out

☐ Paper feed rates

■ 203.2 mm/sec (8.0 inch/sec):   high quality mode, 25.4-mm feed

■ 294.64 mm/sec (11.6 inch/sec): high speed mode, continuous feed

☐ PF interval
Programmable in 0.017 mm (1/1440 inch) steps

1.2.1.4 Paper Support

☐ Cut sheets

Table 1-6. Cut Sheets

Paper size	Dimensions		Thickness	Weight	Paper type
	Width	Length			
A4	210 mm	297 mm	0.08-0.11 mm	64-90 g/m^2 (17-24(lb))	Plain paper Recycled paper
A5	148 mm	210 mm			
A6	105 mm	148 mm			
B5	182 mm	257 mm			
Letter	215.9 mm (8.5")	279.4 mm (11")			
Legal	215.9 mm (8.5")	355.6 mm (14")			
Executive	184.2 mm (7.25")	266.7 mm (10.5")			
Half Letter	139.7 mm (5.5")	215.9 mm (8.5")			
User defined	50.8-329 mm	127-1117.6 mm			

> **CAUTION** !
> ■ Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade paper.
> ■ It is necessary that there is no wrinkle, nap, tear, fold, and so on in the form.
> ■ The curve of form must be 5mm or below.
> ■ Use paper under normal conditions
>   • Temperature 15 to 25°C (59 to 77°F)
>   • Humidity 40 to 60% RH

☐ Envelopes

Table 1-7. Envelopes

Paper size	Dimensions		Thickness	Weight	Paper type
	Width	Length			
No.10 *1	241.3 mm (9.5")	104.8 mm (4.125")	N/A	75-90 g/m^2 (20-24(lb))	Bond paper Air mail PPC
DL *1	220 mm	110 mm			
C6 *1	162 mm	114 mm			
220 x 132*2	132 mm	220 mm	0.1 mm	82 g/m^2	

Note *1: Check that the flap is on the long edge and can be folded.

*2: Bundled with the media such as Photo Quality Ink Jet Cards.

> **CAUTION** !
> ■ **Use paper under normal conditions**
>   • **Temperature 15 to 25°C (59 to 77°F)**
>   • **Humidity 40 to 60% RH**
> ■ **Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade of paper.**
> ■ **It is necessary that there is no wrinkle, nap, tear, fold, so on in the form.**
> ■ **Don't use the adhesive envelopes.**
> ■ **Don't use sleeve insert envelopes and cellophane window envelopes.**

☐   Exclusive papers

Quality: EPSON Exclusive paper

Table 1-8. Exclusive Papers

Item	Size	Width (mm)	Length (mm)	Thickness (mm)	Weight (g/m²)
Photo Paper*3	A4	210	297	0.23	194
	4" x 6"	101.6	152.4		
Premium Glossy Photo Paper	Letter	215.9	279.4	0.27	255
	A4	210	297		
	8" x 10"	20.32	254		
	5" x 7"	127	178		
	4" x 6"	101.6	152.4		
	3R	89	127		
Premium Semigloss Photo Paper	Letter	215.9	279.4	0.27	250
	A4	210	297		
	4" x 6"	101.6	152.4		
Matte Paper Heavyweight*3	Letter	215.9	279.4	0.23	167
	A4	210	297		
	8" x 10"	203	254		
Double-sided Matte Paper*3	Letter	215.9	279.4	0.25	178
	A4	210	297		
Economy Photo Paper*3	A4	210	297	0.23	188
Photo Quality Ink Jet Paper*3	A4	210	297	0.12	102
Glossy Photo Paper*1*3	Letter	215.9	279.4	0.23	188
	4" x 6"	101.6	152.4		
Premium Glossy Photo Paper	4" x 6"	101.6	152.4	0.25	238

Table 1-8. Exclusive Papers

Item	Size	Width (mm)	Length (mm)	Thickness (mm)	Weight (g/m²)
Ultra Glossy Photo Paper*2 Ultra Premium Glossy Photo Paper *1	A4	210	297	0.30	290
	Letter	215.9	279.4		
	4" x 6"	101.6	152.4		
	3R	89	127		

Note   *1:   For CX4200/CX4800 only.

       *2:   For DX4200/DX4800/DX4850 only.

       *3:   Not supported with stand-alone functions of copy and memory card print.

> **CAUTION**
> !
>
> ■   **Use paper under normal conditions**
> - **Temperature 15 to 25°C (59 to 77°F)**
> - **Humidity 40 to 60% RH**
> ■   **Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade of paper.**
> ■   **It is necessary that there is no wrinkle, nap, tear, fold, so on in the form.**
> ■   **The curve of form must be 5 mm or below.**

1.2.1.5 Printing Area

☐ Cut sheet (standard printing)

■ Printable area
The print quality is guaranteed for the print area above the 3 mm bottom margin. For paper width (PW) and paper length (PL), refer to "1.2.1.4 Paper Support" *(p.14)*.
Refer to the following table. As for each margin area, refer to Figure 1-3 *(p.16)*.

Table 1-9. Applicable Paper/Printing Area

Paper type		Left margin	Right margin	Top margin	Bottom margin
Cut sheets	A4	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")
	A5				
	A6				
	B5				
	Letter				
	Legal				
	Executive				
	Half Letter				
	User defined				
Exclusive papers	Photo Paper	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")
	Premium Glossy Photo Paper				
	Premium Semigloss Photo Paper				
	Matte Paper Heavyweight				
	Double Sided Matte Paper				
	Economy Photo Paper				
	Photo Quality Ink Jet Paper				
	Glossy Photo Paper				
	Premium Glossy Photo Paper				
	Ultra Glossy Photo Paper Ultra Premium Glossy Photo Paper				
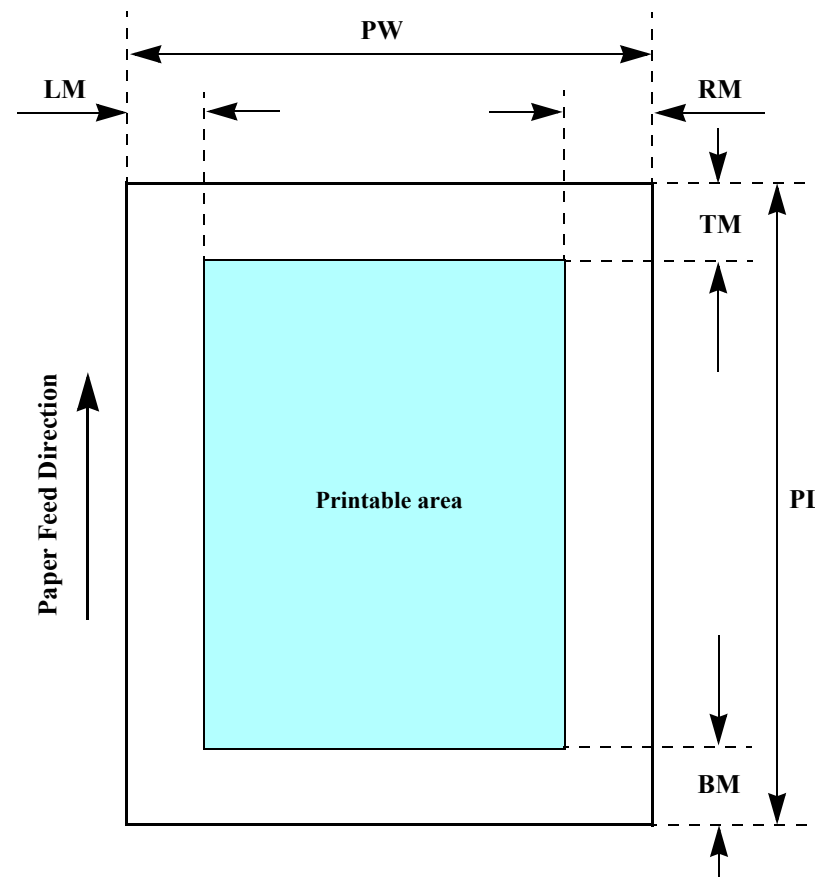
Figure 1-3. Printable Area Cut Sheet (Standard Printing)

□   Cut sheet (border-free printing)

■   Printable area
For paper width (PW) and paper length (PL), refer to "1.2.1.4 Paper Support" *(p.14)*.
Refer to the following table. As for each overhang area, refer to Figure 1-4 *(p.18)*.

Table 1-10. Applicable Paper/Printing Area (For Printing)

Paper Type	Size	LO (mm)	RO (mm)	TO (mm)	BO (mm)
Photo Paper	A4	2.54	2.54	2.96	4.02
	4" x 6"	2.54	2.54	1.34	2.54
Premium Glossy Photo Paper	Letter	2.54	2.54	2.96	4.02
	A4	2.54	2.54	2.96	4.02
	8" x 10"	2.54	2.54	2.96	4.02
	5" x 7"	2.54	2.54	2.96	4.02
	4" x 6"	2.54	2.54	1.34	2.54
	3R	2.54	2.54	1.34	2.54
Premium Semigloss Photo Paper	Letter	2.54	2.54	2.96	4.02
	A4	2.54	2.54	2.96	4.02
Matte Paper Heavyweight	Letter	2.54	2.54	2.96	4.02
	A4	2.54	2.54	2.96	4.02
	8" x 10"	2.54	2.54	2.96	4.02
Double-sided Matte Paper	Letter	2.54	2.54	2.96	4.02
	A4	2.54	2.54	2.96	4.02
Economy Photo Paper	A4	2.54	2.54	2.96	4.02
Photo Quality Ink Jet Paper	A4	2.54	2.54	2.96	4.02
Premium Glossy Photo Paper	4" x 6"	2.54	2.54	1.34	2.54

Table 1-10. Applicable Paper/Printing Area (For Printing)

Paper Type	Size	LO (mm)	RO (mm)	TO (mm)	BO (mm)
Ultra Glossy Photo Paper Ultra Premium Glossy Photo Paper	A4	2.54	2.54	2.96	4.02
	Letter	2.54	2.54	2.96	4.02
	4" x 6"	2.54	2.54	1.34	2.54
	3R	2.54	2.54	1.34	2.54

Table 1-11. Applicable Paper/Printing Area (For Copying)

Paper Type	Size	LO (mm)	RO (mm)	TO (mm)	BO (mm)
Photo Paper	A4	2.54	2.54	2.96	5.08
	4" x 6"				
Premium Glossy Photo Paper	Letter				
	A4				
	8" x 10"				
	5" x 7"				
	4" x 6"				
	3R				
Premium Semigloss Photo Paper	Letter				
	A4				
	5" x 7"				
	4" x 6"				
	3R				
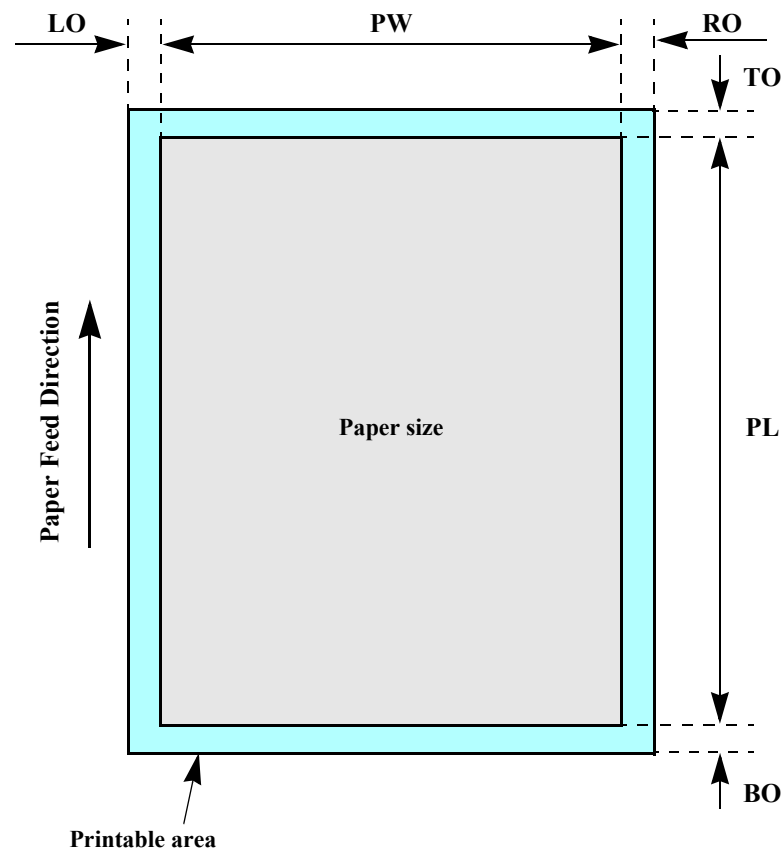
Figure 1-4. Printable Area for Cut Sheet (Border-free Printing)

❑   Envelopes

■   Printable area
For paper width (PW) and paper length (PL), refer to "1.2.1.4 Paper Support" *(p.14)*.
Refer to the following table. As for each margin area, refer to Figure 1-5 *(p.19)*.

Table 1-12. Applicable Paper/Printing Area

Paper type	Left Margin	Right Margin	Top Margin	Bottom Margin
No.10	3mm (0.12")	3mm (0.12")	3mm (0.12")	20mm (0.79")
DL				
C6				
220 x 132				
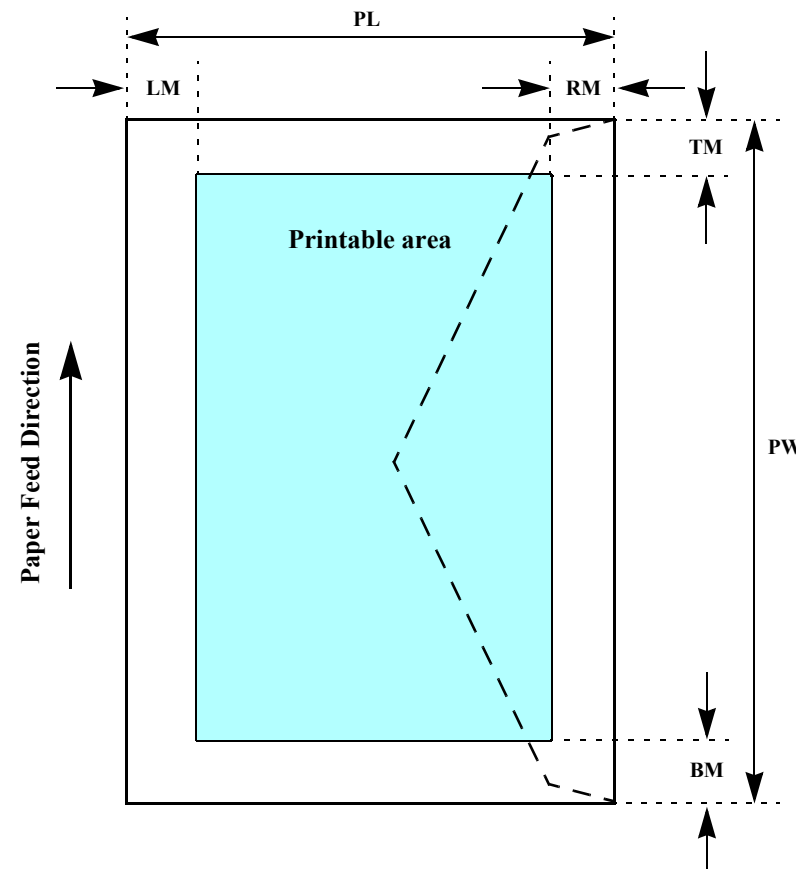
Figure 1-5. Printable Area for Envelopes

1.2.1.6 Ink Cartridge Specification (TBD)

☐ Type/color: EPSON-brand special ink cartridges

Table 1-13. Ink Cartridge

Color	Size	Stylus CX4100/ CX4700	Stylus CX4200/ CX4800	Stylus DX4200/ DX4800/DX4850
Black	S size	T0621	T0601	---
	SS size	T0631	---	T0611
Cyan	S size	---	T0602	---
	SS size	T0632	---	T0612
Magenta	S size	---	T0603	---
	SS size	T0633	---	T0613
Yellow	S size	---	T0604	---
	SS size	T0634	---	T0614

☐ Print Capacity (TBD)

■ Black Ink Cartridge: 400 pages/A4
(ISO/IEC10561 Letter Pattern at 360x720 dpi)
380 pages/A4
(360x720 dpi, 5% duty)

■ Color Ink Cartridge

• S size: 450 pages/A4 (360x720 dpi, 5% duty for each color)
• SS size: 260 pages/A4 (360x720 dpi, 5% duty for each color)

☐ Shelf life: After packing is opened, it is assumed 6 months, and assumes 2 years including this.

☐ Storage Temperature

Table 1-14. Storage Temperature

Situation	Storage Temperature	Limit
When stored in individual boxes	-30 ºC to 40 ºC	1 month max. at 40 ºC
When installed in main unit	-20 ºC to 40 ºC	

☐ Dimension: 12.7mm (W) x 73.46mm (D) x 55.25mm (H)

Pending
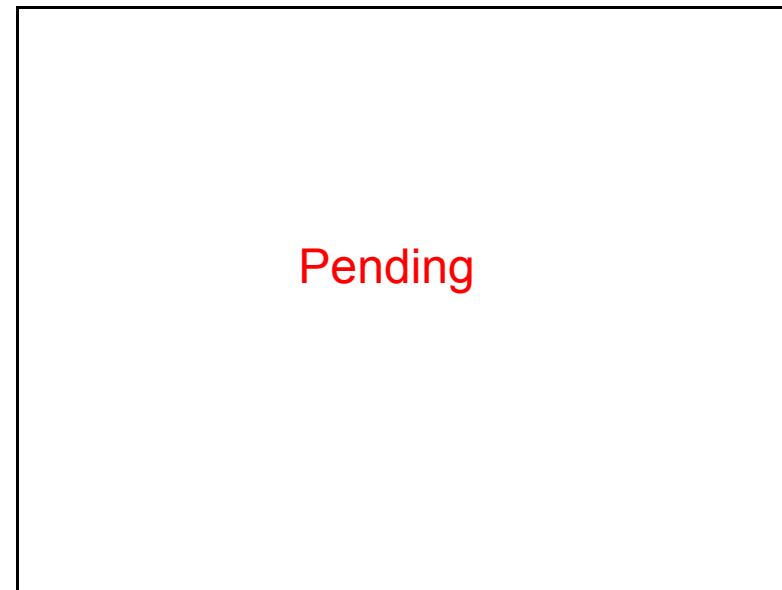
Figure 1-6. Ink Cartridge

CAUTION !	The ink in the ink cartridge freezes when leaving it in the environment of -16 °C or under. It takes 3 hours that the frozen ink becomes usable when moving it from the environment of -20 °C to the environment of 25 °C.

1.2.2 Scanner Specifications

This section covers specifications of the scanner.

1.2.2.1 Basic Specifications

□ Product type: Flatbed color image scanner

□ Scanning method: Scanning of fixed document with mobile scan head

□ Sensor: CIS

□ Maximum scan area: 8.5" x 11.7" (216 mm x 297 mm)

□ Document sizes: A4 or US letter

□ Max. effective pixels: 10,200 x 14,040 pixels (1200 dpi)

□ Resolution

   ■ Main scan: 1200 dpi

   ■ Sub scan: 2400 dpi with Micro Step

□ Scanning resolution: 50 to 4800 dpi (selectable in 1-dpi steps), 7200 dpi, 9600 dpi

□ Gradations (pixel depth):   Each color pixel has 16-bit input and either 1-bit or 8-bit output.

□ Scanning speed: 1200 dpi

   ■ Color: Approx. 30 msec/line

   ■ Monochrome: Approx. 10 msec/line

□ Light source: RGB Three Color LED

1.2.2.2 Detailed Specifications

□ Control commands: ESC/I D7

□ Gamma correction: Two user-defined levels

1.2.2.3 Image Scanning Area

Table 1-15. Image Scanning Area

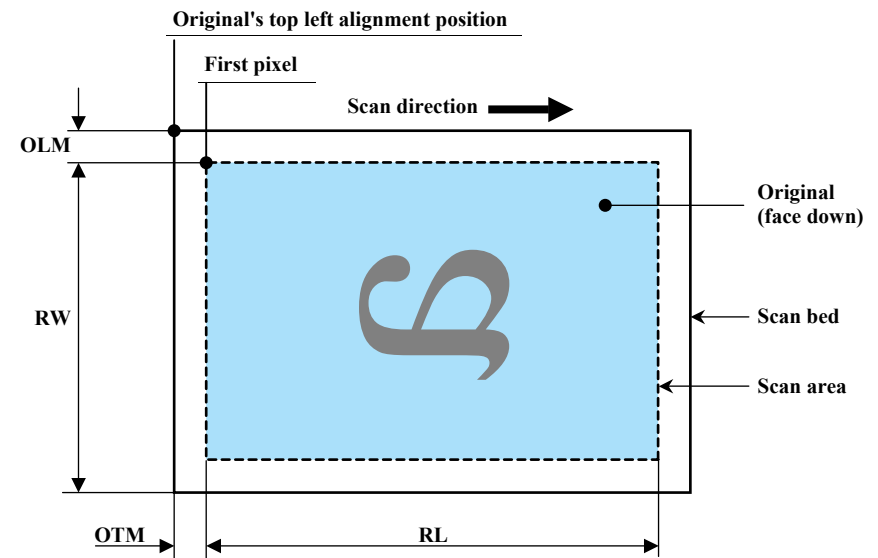| RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216 mm (8.5")	1.5 mm ± 1 mm	297 mm (11.7")	1.5 mm ± 1 mm

Figure 1-7. Image Scanning Area

1.2.3 Common

1.2.3.1 Electric Specification

☐ Primary power input

Table 1-16. Primary Power Input

	100-120 V model	220-240 V model
Rated power supply voltage (ACV)	100 ~ 120	220 ~ 240
Input voltage range (ACV)	90 ~ 132	198 ~ 264
Rated current (A)	0.4 A (max. 0.7 A w/ card slot model) (max. 0.7 A w/o card slot model)	0.2 A (max. 0.3 A w/ card slot model) (max. 0.3 A w/o card slot model)
Rated frequency (Hz)	50 ~ 60	
Input frequency range (Hz)	49.5 ~ 60.5	
Power consumption (W)	Approx. 13 W (w/ card slot model) Approx. 13 W (w/o card slot model) (Standalone copying, ISO10561 Letter Patter, Plain Paper - Text)	
	Approx. 4.5 W (Low-power Mode)	
	Approx. 4.0 W (Sleep Mode)	
	Approx. 0.2 W (Power Off Mode)	Approx. 0.3 W (Power Off Mode)

Note 1: This product complies with the "Energy Star" standards.

2: If the printer is not operated at all for at least five minutes, the standby function reduces the current to the motor to conserve power.

3: If the scanner is not operated at all for at least five minutes, the standby function reduces the current to the motor to conserve power.

☐ Insulation resistance (TBD)
10MΩ minimum (tested between AC line and chassis, test voltage: DC500V)

☐ Dielectric strength (TBD)

■ AC1000 Vrms for one minute or AC1200 Vrms for one second (100-120V version)

■ AC1500 Vrms for one minute (220-240V version)

1.2.3.2 Environmental Performance

Table 1-17. Environmental Performance

Condition	Temperature	Humidity *2	Impact	Vibration
Operating	10 ~ 35°C *3	20 ~ 80% *3	1G, 1 x 10⁻³ seconds	0.15G
Not operating *1	-20 ~ 40°C	5 ~ 85%	2G, 2 x 10⁻³ seconds	0.50G

Note *1: After unpacking (storage)

*2: No condensation

*3: Under the following conditions
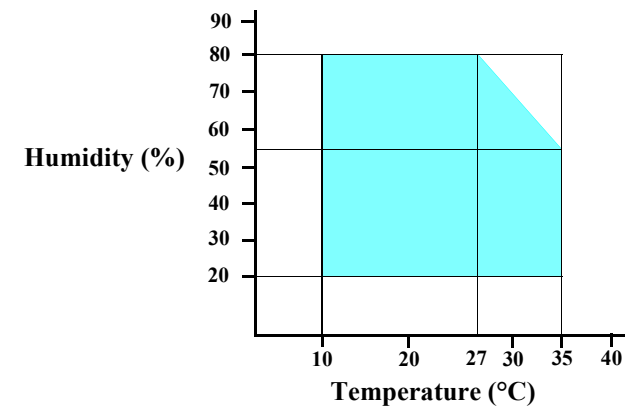
Figure 1-8. Temperature/Humidity Range

1.2.3.3 Durability

☐ Total print life: 10,000 pages (black only, A4), or five years (whichever comes first)

☐ Print Head Life: Six billion shots (per nozzle) or five years (whichever comes first)

☐ Scanner head: MCBF (36,000 cycles)

1.2.3.4 Safety Standards: EMC

Table 1-18. Safety Standards: EMC

	100-120 V version	**220-240 V version**
Safety standards	UL60950	EN 60950
	CSA22.2 No.60950	
EMI	FCC part15 subpart B class B	EN 55022(CISPR Pub.22) class B
	CSA C108.8 class B	AS/NZS CISPR22 class B

1.2.3.5 Acoustic Noise

☐   Noise level
Approx. 45 dB (according to ISO7779 when for copying)

1.2.3.6 CE Marking

☐   220-240 V version

■   Low Voltage Directive 73/23/EEC: EN60950

■   EMC Directive 89/336/EEC: EN55022 Class B
EN61000-3-2
EN61000-3-3
EN55024

1.3 Interface

The EPSON Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850 provides the following interface.

1.3.1 USB Interface

☐ Standards

■ "Universal Serial Bus Specifications Revision 2.0"

■ "Universal Serial Bus Device Class Definition for Printing Devices Version 1.1" (printer unit)

■ "Universal Serial Bus Mass Storage Class Bulk-Only Transport Revision 1.0" (storage unit)*

Note "*": Only for CX4700/CX4800/DX4800/DX4850.

☐ Transfer rate: 480 Mbps (High Speed Device)

☐ Data format: NRZI

☐ Compatible connector: USB Series B

☐ Recommended cable length: 2 [m] or less

☐ Device ID

Table 1-19. Device ID

Product Name	Device ID
Stylus CX4700	[00H][5AH] MFG:EPSON; CMD:ESCPL2,BDC,D4,ESCPR1; MDL:Stylus[SP] CX4700; CLS:PRINTER; DES:EPSON[SP]Stylus[SP] CX4700;
Stylus CX4100 Stylus CX4200 Stylus CX4800 Stylus DX4200	[00H][5AH] MFG:EPSON; CMD:ESCPL2,BDC,D4,ESCPR1; MDL:Stylus[SP] CX4800; CLS:PRINTER; DES:EPSON[SP]Stylus[SP] CX4800;

Table 1-19. Device ID

Product Name	Device ID
Stylus DX4800 Stylus DX4850	[00H][5AH] MFG:EPSON; CMD:ESCPL2,BDC,D4,ESCPR1; MDL:Stylus[SP] DX4800; CLS:PRINTER; DES:EPSON[SP]Stylus[SP] DX4800;

□   Connector signal layout

Table 1-20. Connector pin assignment and signals

Pin No.	Signal name	I/O	Function description
1	VCC	-	Cable power. Max. power consumption is 2 mA.
2	-Data	Bi-D	Data
3	+Data	Bi-D	Data, pull up to +3.3 V via 1.5 K ohm resistor.
4	Ground	-	Cable ground

Pin #2   **Pin #1**
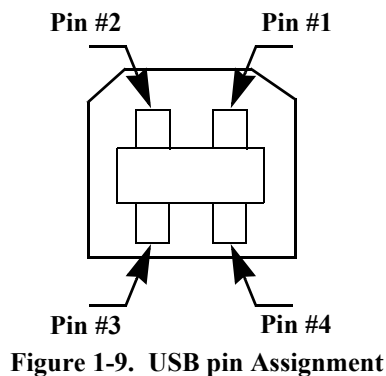
Pin #3   **Pin #4**
Figure 1-9. USB pin Assignment

□   Product ID

■   0x0819 (Stylus CX4700/CX4800/DX4800/DX4850)

■   0x0820 (Stylus CX4100/CX4200/DX4200)

□   Endpoint attribute

Table 1-21. Endpoint Attribute (Card Slot Model)

I/F No.	Endpoint Address	Endpoint Type	Linked Interface
0x00	0x01	Bulk Out	Scanner
0x00	0x02	Bulk In	Scanner
0x01	0x04	Bulk Out	Printer
0x01	0x05	Bulk In	Printer
0x02	0x07	Bulk Out	Card
0x02	0x08	Bulk In	Card

Table 1-22. Endpoint Attribute (Without Card Slot Model)

I/F No.	Endpoint Address	Endpoint Type	Linked Interface
0x00	0x01	Bulk Out	Scanner
0x00	0x02	Bulk In	Scanner
0x01	0x04	Bulk Out	Printer
0x01	0x05	Bulk In	Printer

1.3.2 Standard Card Slots
(Only for CX4700/CX4800/DX4800/DX4850)

1.3.2.1 Memory Card

Table 1-23. Memory Card

Memory card standards		Slots	Supported memory cards
Compact Flash	CF+ and CompactFlash Specification Revision 1.4 compliant	CF Type II slot	• Compact Flash (memory card only) • Microdrive
SmartMedia	SmartMedia Standard 2000 compliant	SmartMedia slot	Smart Media (maximum capacity: 128 MB)
Memory Stick	MemoryStick Standard version 1.3 compliant	Memory Stick/ Memory Stick PRO slot	• Memory Stick (maximum capacity: 128 MB, including versions with memory select function) • MagicGate Memory Stick (maximum capacity: 128 MB, copy protection function is not supported) • Memory Stick Duo (requires Memory Stick Duo adapter)
Memory Stick PRO	MemoryStick Standard Memory Stick PRO Format Specifications version 1.0 compliant		• Memory Stick Duo (requires Memory Stick Duo adapter) • Memory Stick PRO Duo • (requires Memory Stick Duo adapter)
Memory Stick PRO Duo	MemoryStick Standard Memory Stick PRO Format Specifications version 1.0 compliant		
SD	SD Memory Card Specifications / PART1. Physical Layer Specification Version 1.0 compliant	SD/MMC slot	• SD (Secure Digital) memory card • miniSD card (requires SD adapter)
MultiMedia Card	MultiMediaCard Standard compliant		MultiMediaCard
xD-Picture Card	xD-Picture Card™ Card Specification Version 1.00 compliant	xD-Picture Card slot	xD-Picture Card

> **CAUTION**
>
> **Note the following caution points when handling the memory card.**
> - **Since the SD card and Memory Stick share the same slot, only one can be inserted at a time.**
> - **Since the SmartMedia and xD-Picture Card share the same slot, only one can be inserted at a time.**
> - **When a memory card is being accessed, be sure to keep the memory card slot's cover closed and do not touch the memory card.**

1.3.2.2 Supported Power Supply Voltage

☐ 3.3 V/ 5 V (both)

☐ 3.3 V (only)

NOTE   1:   3.3 V power is supplied to media that support both 3.3 V and 5 V.

2:   Maximum current to memory card is 500 mA.

3:   5V type memory cards are not supported.

1.3.2.3 Multi-slot Operations

□ Overview

- There is only one type of card that can be used to simultaneously access both a connected computer and the direct printing function.

- The slots have assigned priority to determine which slot will be accessed first when cards are inserted in several slots at once.

- To select a card that has been inserted in a non-active slot, the card in the active slot must first be removed.

  • Direct printing:
    Only the image files in the active slot are valid and have assigned frame numbers. The number of images will not change if a card is also inserted in a non-selected slot.
  • Connection to computer (Windows):
    Only one drive is displayed at a time as a "removable disk" and only the card that is in the active slot can be accessed via the removable disk. A card that has been inserted into a non-selected slot cannot be accessed.
  • Connection to computer (Macintosh):
    Only the card in the active slot can be mounted on the desktop. A card that has been inserted into a non-selected slot cannot be mounted on the desktop.

□ Details

- Access priority
  The access priority among slots is assigned as:
  1: CF (Micro Drive)
  2: Smart Media/xD-Picture Card
  3: Memory Stick (Memory Stick PRO)/SD (MMC)

- Slot selection when power is turned on
  If cards are inserted in several slots when the power is turned on, the active slot is determined by the priority ranks listed above.
  Example: If Smart Media and Memory Stick are both inserted at power-on, the Smart Media slot becomes the active slot.

- Slot selection after power is turned on
  When a card is removed from the active slot, the slot with the next-highest priority becomes the active slot (if a card has been inserted into it). There is no need to re-insert any card before accessing it. If no slots contain any cards, the highest-priority slot (CF Micro Drive) again becomes the active slot.
  Cards can be removed from non-selected slots in any order.
  Example: If a memory stick and CF card are inserted while Smart Media is selected, CF becomes selected (active) once Smart Media is removed.

1.4 Stand-alone Copy

1.4.1 Basic Specifications

1.4.1.1 Supported Paper Sizes, Types and Qualities

Table 1-24. Supported Paper Sizes, Types and Qualities (for EAI)

Paper type		Quality *1	Paper size	
Paper name	Panel indication		Paper size	Panel indication
Plain Paper	Plain Paper	Plain Paper	Letter	Letter
Premium Glossy Photo Paper	Photo Paper	Photo Paper*2	Letter 5" x 7" 4" x 6"	Letter 5" x 7" 4" x 6"
Premium Semigloss Photo Paper	Photo Paper	Photo Paper*2	Letter	Letter
High Gloss Photo Paper	Photo Paper	Photo Paper*2	Letter 5" x 7" 4" x 6"	Letter 5" x 7" 4" x 6"

Note *1:   The quality of draft copy is not affected by "Paper type" selection.

Table 1-25. Supported Paper Sizes, Types and Qualities (for EUR/ASIA)

Paper type		Quality*1	Paper size	
Paper name	Panel indication		Paper size	Panel indication
Plain Paper	Plain Paper	Plain Paper	A4	A4
Premium Glossy Photo Paper	Photo Paper	Photo Paper*2	A4 13 x 18*4 10 x 15*3	A4 13 x 18*4 10 x 15*3
Premium Semigloss Photo Paper	Photo Paper	Photo Paper*2	Letter	Letter
High Glossy Photo Paper	Photo Paper	Photo Paper*2	Letter 13 x 18*4 10 x 15*3	Letter 13 x 18*4 10 x 15*3

Note *1:   The quality of draft copy is not affected by "Paper type" selection.

   *2:   For photo paper: SN, AF LUT parameter is same as Premium Glossy Photo Paper.

   *3:   10 x 15:   The panel indicator only. The printer chalks 10 x15 format up to 4 x 6 format.

   *4:   13 x 18:   The panel indicator only. The printer chalks 13 x 18 format up to 5 x 7 format.

1.4.1.2 Zoom Function

The zoom function provides enlarged or reduced copies of originals. The either of the following can be selected from the operation panel.

☐ Actual (The state which "Fit to page" is not selected. It is the power-on default.) The zoom factor is set to 100%.

☐ Fit to page
   This function detects the image size of the original and automatically sets the zoom factor of the copy according to the copy paper's printable area.

1.4.1.3 Number of Copies Setting

This function sets the number of copies. The setting range is 1 to 9 and 100.

1.4.1.4 Maximum Copy Size

☐ 216 mm x 297 mm

1.4.1.5 Copy Layout

The following copy layout is provided according to "Paper type", "Paper size" and zoom selections.

☐ Standard copy
   Provided for ordinary use with 3mm copy margin from every side.

☐ BorderFree copy
   Border-free printing of copies occurs when the print area is set as larger than the copy paper's size. In such cases, the outer edges of the original image may be omitted in the printed copy.

☐ Small Margins copy
   This function sets a 1.5mm margin on all four sides when printing in order to make maximum use of the original image and copy paper.

NOTE: Only "Standard Copy" can be used in draft copy mode.

Table 1-26. Copy Layout (for EAI)

Zoom	Paper type	Paper size	B&W / Color	Layout
Actual*1	Plain Paper	Letter	B&W, Color	Standard
		4" x 6", 5" x 7"	B&W, Color	Standard
	Photo Paper	Letter, 4" x 6", 5" x 7"	B&W, Color	Small margin
Fit to page*2	Plain Paper	Letter	B&W, Color	Standard
		4" x 6", 5" x 7"	B&W, Color	Standard
	Photo Paper	Letter, 4" x 6", 5" x 7"	B&W, Color	Border free

Note *1： Actual is the state that "Fit to page" is not selected.

*2： "Fit to page" automatically sets the enlarge/reduce scale so that the entire image fits into the printable area or the border free area when border free layout is selected. When the original image is smaller than general card size (approx. 54mm x 86mm), the print margins will be different from the one that is defined by each layout. The image placement uses the upper left corner as the origin and any margins that occur during the fitting process occur along the bottom and/or right edge.

Table 1-27. Copy Layout (for EUR/ASIA)

Zoom	Paper type	Paper size	B&W / Color	Layout
Actual*1	Plain paper	A4	B&W, Color	Standard
		10 x 15, 13 x 18	B&W, Color	Standard
	Photo Paper	A4, 10 x 15, 13 x 18	B&W, Color	Small margin
Fit to page	Plain paper	A4	B&W, Color	Standard
		10 x 15, 13 x 18	B&W, Color	Standard
	Photo paper	A4, 10 x 15, 13 x 18	B&W, Color	Border free

Note *1： Actual is the state that "Fit to page" is not selected.

*2： "Fit to page" automatically sets the enlarge/reduce scale so that the entire image fits into the printable area or the border free area when border free layout is selected. When the original image is smaller than general card size (approx. 54mm x 86mm), the print margins will be different from the one that is defined by each layout. The image placement uses the upper left corner as the origin and any margins that occur during the fitting process occur along the bottom and/or right edge.

1.4.1.6 Multiple Copies From an Original

Second and subsequent copies can be printed from an original without scanning. When printing two or more copies, under the following settings the scan data can be stored in the unit's memory so that the second and subsequent copies can be printed without scanning.

☐ "Draft" mode (monochrome/color)

☐ "Text" mode (monochrome)

1.4.2 Copy Speed

1.4.2.1 Black Copy Speed

☐ Plain Paper – Draft 13.4 cpm (Copy per minute), Plain Paper – 3.0 cpm

☐ Black e-Memo text A4 size pattern, zoom 100%

The above speed is for the second and subsequent copies (the time between ejection of the first page to ejection of the second page).

1.4.2.2 Color Copy Speed

☐ Plain Paper – Draft 13.4 cpm (Copy per minute), Plain Paper –1.0 cpm

☐ Color e-Memo text A4 size pattern, zoom 100%

The above speed is for the second and subsequent copies (the time between ejection of the first page to ejection of the second page)

1.4.3 Configuration for copying

Table 1-28. Configuration for Copying

Copy Mode setting			Scan and Print configuration				
Paper type	B&W / Color*2	Enlarge / Reduce*1 (%)	Print resolution (H x V dpi)	Dot size	MW	High Speed	LUT
Plain Paper	B&W	100 (Default)	360 x 360	VSD1	Off	On	CC2
	Color	100 (Default)	360 x 720	VSD1	On	On	CC2
Photo Paper	B&W	100 (Default)	1440 x 720	VSD3	On	On	CC3
	Color	100 (Default)	1440 x 720	VSD3	On	On	CC3
Draft*3 (Plain paper only)	B&W	100 (Default)	360 x 120	VSD1	Off	On	CC1
	Color	100 (Default)	360 x 120	VSD1	Off	On	CC1

Note *1: "Default" is the state in which "Fit to page" is not selected. When "Fit to page" is selected, scan resolution will be optimized according to enlarge/reduce scale.

*2: Pure black will be used in both B&W and color mode.

*3: With "Draft", both real black and composite black will be used for black printing.

1.4.4 Relation between Original and Copy

1.4.4.1 Standard Copy

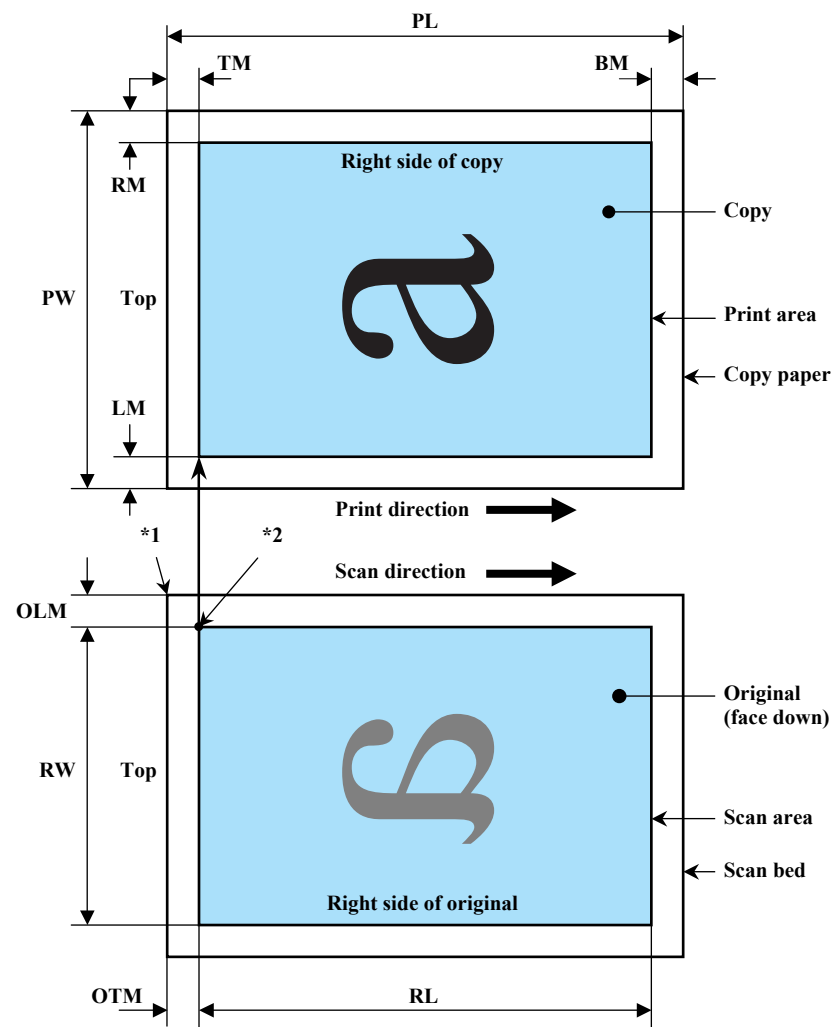The following table shows the relative positioning of the original and copy.

Table 1-29. Original (scanner)

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216 mm (8.5")	3 mm	297 mm (11.7")	3 mm

Table 1-30. Copy (printer)

RM	LM	TM	BM
3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")

Note :   Refer to "1.2.1.4 Paper Support" *(p.14)* for paper width (PW) and paper length (PL).

Note *1:   This indicates the top left corner of the original. Normally, this corner is aligned with the scan bed's top right corner as the reference point.

*2:   This indicates the scan start position at the top left of the original, which corresponds to the print start position at the top left of the copy. The bottom right corner position of the copy is within the print area but varies according to the enlarge/reduce setting.

Figure 1-10. Standard Copy

1.4.4.2 BorderFree Copy

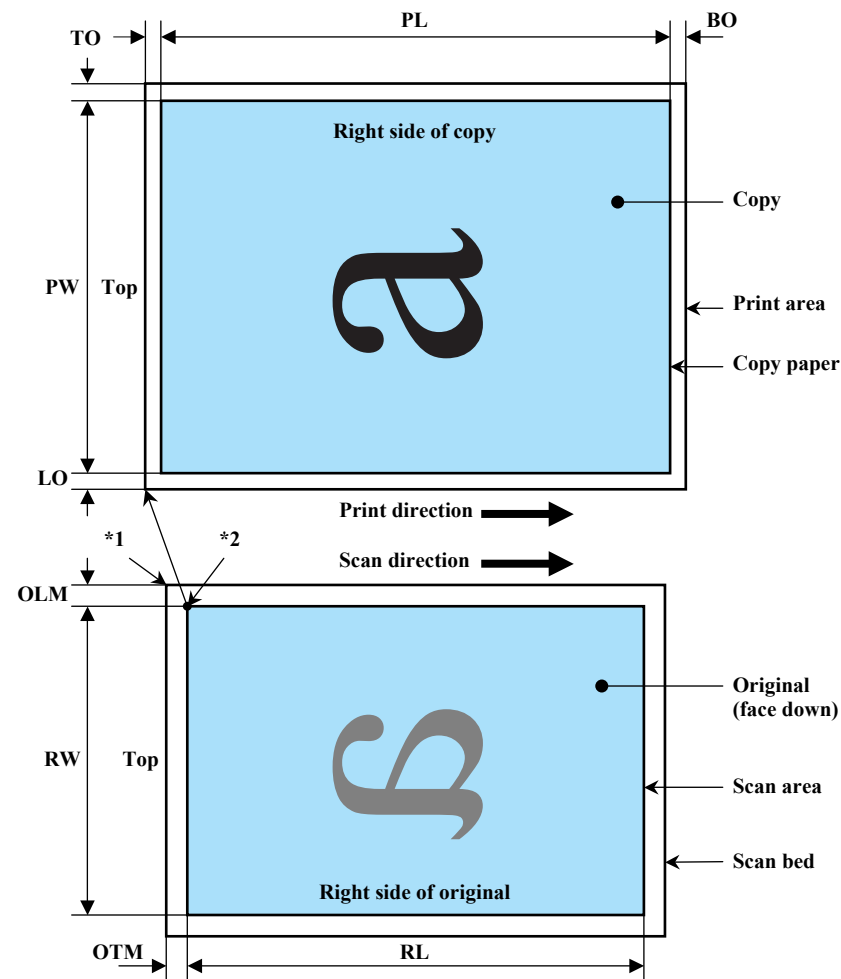The following table shows the relative positioning of the original and copy.

Table 1-31. Original (scanner)

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216 mm (8.5")	1.5 mm ± 1 mm	297 mm (11.7")	1.5 mm ± 1 mm

Table 1-32. Copy (printer)

RO	LO	TO	BO
2.5 mm	2.5 mm	3.0 mm	5.0 mm

Note :   Refer to "1.2.1.4 Paper Support" *(p.14)* for paper width (PW) and paper length (PL).

Note *1:   This indicates the top left corner of the original. Normally, this corner is aligned with the scan bed's top right corner as the reference point.

*2:   This indicates the scan start position at the top left of the original, which corresponds to the print start position at the top left of the copy. The bottom right corner of the print area varies according to the scale setting in the print area.

Figure 1-11. BorderFree Copy

1.4.4.3 Small Margins copy

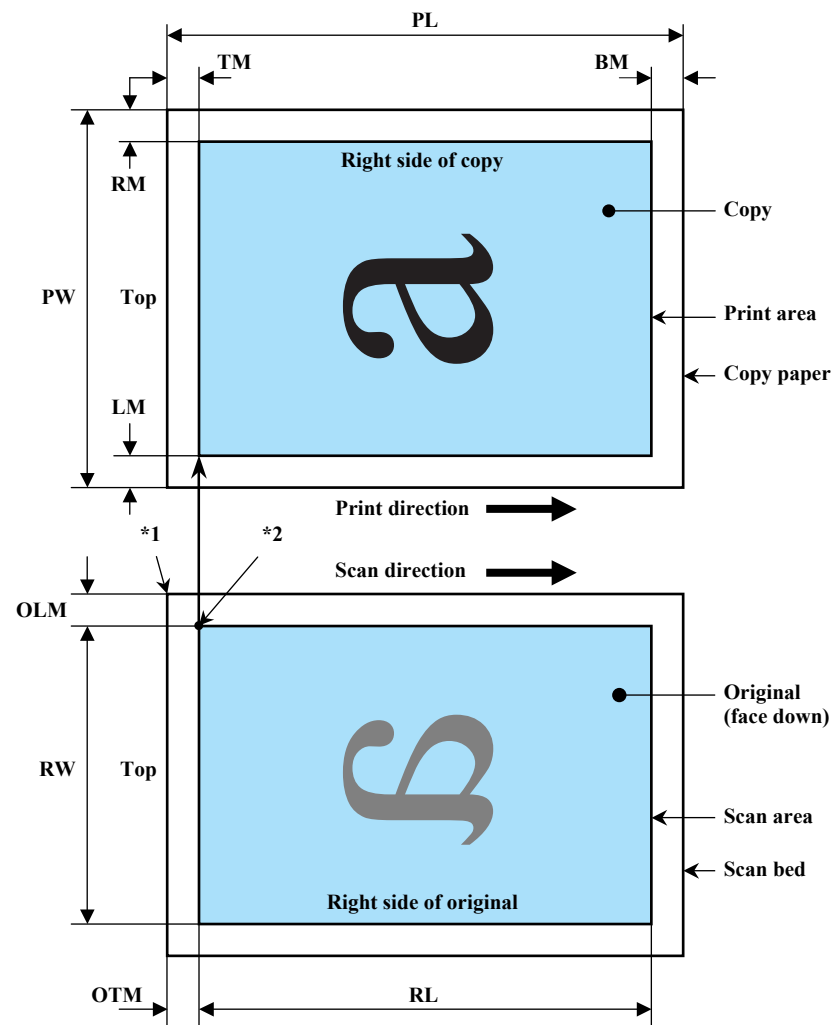The following table shows the relative positioning of the original and copy.

Table 1-33. Original (scanner)

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216 mm (8.5")	1.5 mm ± 1 mm	297 mm (11.7")	1.5 mm ± 1 mm

Table 1-34. Copy (printer)

RM	LM	TM	BM
1.5 mm	1.5 mm	1.5 mm	1.5 mm

Note :   Refer to "1.2.1.4 Paper Support" *(p.14)* for paper width (PW) and paper length (PL).

Note *1:   This indicates the top left corner of the original. Normally, this corner is aligned with the scan bed's top right corner as the reference point.

*2:   This indicates the scan start position at the top left of the original, which corresponds to the print start position at the top left of the copy. The bottom right corner position of the copy is within the print area but varies according to the enlarge/reduce setting.

Figure 1-12. Small Margins copy

1.5 Memory Card Print
(Only for CX4700/CX4800/DX4800/DX4850)

1.5.1 Basic Specifications

1.5.1.1 File System

DCF Version 1.0 or 2.0 is the file system that can be used with this unit's stand-alone printing functions. Operation is not guaranteed when any other file system is used.
The file system used by the card reader function depends on the host's specifications.
For a detailed description of the DCF specifications, see "Design Rule for Camera File System Standard, DCF Version 2.0, JEIDA-CP-3461".

1.5.1.2 Media Format
☐ Media must be formatted according to the DCF Version 1.0 or 2.0 standard.
☐ DOS FAT formats (FAT12, FAT16) and single partition (basic partition)

1.5.1.3 File Formats

The file formats supported by this unit are described below.

☐ JPEG files (*.JPG)
   These are photo data files that comply with the Exif Version 2.21. (Extif version 1.0/2.0/2.1/2.2/2.21)
☐ Camera specification files (*.MRK)
   These are definition files used when in camera specification mode. An "AUTOPRINT.MRK" file whose full path name is no longer than 32 characters is valid.

Note, however, any file that is saved in the following directories or their sub-directories cannot be included as files to be printed.

☐ Directories containing system properties or hidden properties
☐ Directories that contain any double-byte characters in the directory name
☐ "RECYCLED": Windows directory for deleted files
☐ "PREVIEW": Directories containing CASIO's DSC thumbnail images
☐ "SCENE": Directories containing data for CASIO's DSC Best Shot function
☐ "MSSONY": Directories containing SONY's DSC e-mail image data, voice memos, video files, or non-compressed images

☐ "DCIM¥ALBUM¥IMAGE": Directories containing CASIO's DSC album data save directory.

1.5.1.4 Valid Image Size

The maximum image size handled by this unit is:

☐ Horizontal: $80 \leqq X \leqq 9200$ (pixels)
☐ Vertical: $80 \leqq Y \leqq 9200$ (pixels)

1.5.1.5 Maximum Number of Photo Data Files

This unit can handle up to 999 photo data files. If the amount of photo data to be recorded exceeds the capacity of one memory card, this unit uses file sorting rules to sort the photo data into valid photo data in frames numbered from 1 to 999. Although it is possible to print photo data files with frame numbers over 999 that have been specified for printing by camera specification files, the maximum number of frames that can be specified is 999 frames.
If you insert a memory card that contains over 999 photo data files, only files up to 999 will be printed by the "Print All" or "Print index sheet" functions.

1.5.1.6 Thumbnail Image Data

This unit handles thumbnail image data in the DCF Version 1.0 or 2.0 format (Exif format, 160 x 120 pixels).
During this unit's Index sheet and memory card printing modes, the layout is 80 thumbnails per sheet (when using plain paper or special paper in high-speed print mode).

1.5.1.7 File Sorting

This unit stores all photo data files in the memory, using the photo data files' full-path file names (for example, "\CIM\100EPSON\EPSN0000.JPG"), and assigned photo frame numbers. Since photo frame numbers are assigned based on this unit's own proprietary file sorting rules, the assigned frame numbers do not necessarily match those indicated by digital cameras.

1.5.1.8 File Sorting Rules

This unit sorts photo data files based on the following prioritization rule.

■ File name is sorted in ASCII order as full path name.

NOTE: Sorting results are not guaranteed if two files have matching full-path file names. (Matching full-path file names are not allowed under the DOS specification.)

1.5.1.9 Rules for Acquisition of Date/Time Data

The following priorities are used to fetch date and time information from photo data files.

1. Date/time data that complies with the standard format (Exif) for digital cameras
2. Date/time data that complies with the DOS standard file system (file time stamps)
3. Fixed values (01/01/1980, 00:00:00)

Note that the date/time data assigned to individual photo data files does not necessarily match the date/time when the photo was actually taken. The photo date/time may be modified due to the digital camera's calendar settings (presence/absence of functions, incorrect date/time settings, etc.), processing of the photo data after the photo was taken, or subsequent saving of data. In such cases, this unit performs the relevant processing based on the most recently modified date/time data.

1.5.1.10 Number of Sheets which can be Printed in Total

Printing sum total number of sheets presupposes that it is possible to 999 sheets. Moreover, the printing sum total number of sheets per sheet is possible to 99 sheets.

1.5.2 Functions

1.5.2.1 List of Functions

The memory card print menu and its settings are listed in the following table. The values shown in this table indicate the total number of options and the number of pages or copies that can be printed consecutively.

Table 1-35. List of Functions

Memory card printing	Mode selection	Layout	Paper type	Paper size	Page/copies
Print index sheet	Print Index Sheet	None	Plain Paper	1	1
Print from index sheet	Print From Index Sheet	• Standard • Border free	• Plain Paper • Photo Paper	2	1 to 3 (according to marking)
Print all images	Print All / DPOF	• Standard • Border free	• Plain Paper • Photo Paper	2	1
DPOF *	Print All / DPOF	• Standard • Border free	• Plain Paper • Photo Paper	2	1 to 99

Note "*": It is available only DPOF file exists in the memory card.

Note : "Print index sheet" will be selected as default function of Memory Card Print. But when DPOF file exists in the memory card, "Print All / DPOF" will be selected as default and DPOF print can be done easily.

1.5.2.2 Memory Card Printing Mode

☐ Print index sheet printing
This function prints thumbnail images (stored in the memory card) onto an Index Sheet (form) that is marked for selecting images.
The combinations of paper types and paper sizes are fixed as shown right.

☐ Print from index sheet printing
This function prints selected images onto the sheet output by index sheet printing.

☐ Print all images
This function prints all of the image files stored in the memory card. As shown right, the number of printed pages depends on the number of copies to be printed. The settings are described right.

☐ DPOF printing
In this mode, the photo frame numbers previously specified via the camera are printed in the number of pages specified via the camera. Only the paper type and layout are specified on the printer side. If the layout assigned multiple photos per output sheet, photos that have different frame sizes are automatically assigned in the specified number of pages in numerical order (of the specified photo frame numbers). If index print mode was set via the camera, this unit will print in DPOF index layout. (When in DPOF print mode, the mode cannot be switched by writing the print file specification from the host after inserting the memory card.)

Table 1-36. Memory Card Printing Mode

Setting	Memory card printing mode	Description	Option, setting range, etc.
Layout (no menu)	• Print from index sheet printing • Print all images • DPOF printing	Sets print layout	Fixed in combination with paper type and paper size (refer to "1.5.4 Layout and Paper Type, Paper Size" (p.40))
Paper type	Print index sheet printing	Fixed	Plain Paper
	• Print from index sheet printing • Print all images • DPOF printing	Sets paper type	Plain Paper or Photo Paper
Paper size	Print index sheet printing	Fixed	A4 or Letter *1
	• Print from index sheet printing • Print all images • DPOF printing	Sets paper size	A4, 10cm x 15cm*2, or 13cm x 18cm Letter, 4" x 6", or 5" x 7"
Pages/ copies	Print index sheet printing	Fixed	Fixed as 1 page (can vary according to the number of image files)
	Print from index sheet printing	Sets number of printout	1 to 3 (set by the marking to the index sheet)
	Print all images	Sets number of printout	1
	DPOF printing	Sets number of printout	The number of copies specified via the camera is used. The setting range is 1 to 99 copies (default is 1 copy).
Quality	Print index sheet printing	Fixed	Prints it by the quality of 360 x 720dpi of Plain Paper. Only the Color print is supported.
	• Print from index sheet printing • Print all images • DPOF printing	Sets print quality	Fixed according to paper type (refer to "1.5.9 Relation between Paper Type and Quality" (p.46))

Note *1: Letter size will be used for Stylus CX4200/CX4800.
A4 size will be used for other models.

*2: The panel indicator only. The printer chalks 10 x 15 format to 4 x 6 format.

1.5.3 Index Sheet

☐ 30 thumbnail images are assigned per index sheet.

☐ There are 3 marking areas for each thumbnail and you can set the number of copies up to 3.

☐ "Paper type" and "Paper size" can be set from the operation panel.

☐ The layout is fixed according to the paper type and it is not indicated on the sheet. (Refer to "1.5.4 Layout and Paper Type, Paper Size" *(p.40)*)

☐ Images are arranged in the Index sheet in ascending order (of image file number). (Refer to "1.5.1.7 File Sorting" *(p.34)* and "1.5.1.8 File Sorting Rules" *(p.35)*)

☐ Index sheet will be printed from the last page, in descending order. (The sheet containing first thumbnail comes top of printouts.)

☐ The mode transition may occur from "Print index sheet" to "Print from index sheet" when the "Print index sheet" completes successfully.
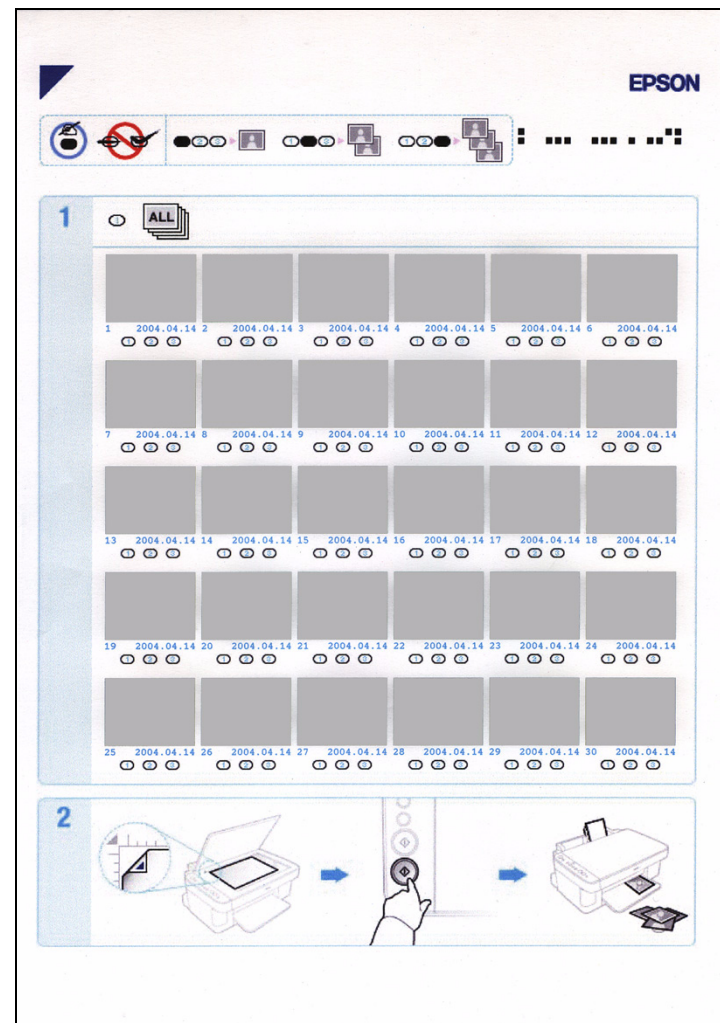
Figure 1-13. Sample of Index Sheet

1.5.3.1 Rules for Scanning Index Sheets

☐ Index sheet scan range

■ Set index sheet in scanner

• Place the side to be scanned face down relative to the scan bed, as described below.
Align the corner of the sheet to the upper left origin point and make sure the sheet is straight. Angled setting of the sheet is allowed as long as the sheet remains within the scan bed's scan range (the maximum angle on the scan bed is about 2.8°).

• The cover must be closed on the original to enable scanning. (This is to prevent any shifting of the position marks while scanning).

• Do not use paper that allows images to "bleed through" to the rear side. (This is to prevent empty bubbles from being filled in by "bleed-through".)

■ Set scan area and original

Table 1-37. Set Scan Area and Original

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216 mm (8.5")	1.5 mm ± 1 mm	297 mm (11.7")	1.5 mm ± 1 mm

Place the Index Sheet face down with its top edge aligned to the left edge of the scan bed, and with the corner of the paper set to the original's top left position.
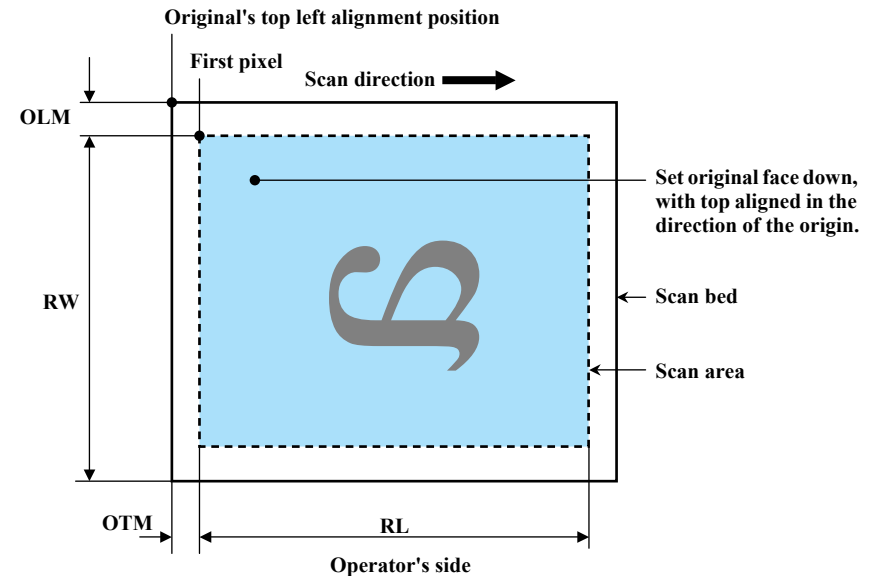
Figure 1-14. Set Scan Area and Original

□   Basic specifications for scanning of index sheets

   ■   Scanning rules for index sheet
       The existence of the following recognition factors is judged using the image
       pattern matching. (Image is binary.)

Table 1-38. Symbols Check

Position mark	Image	Description	Remarks
Left and right edges (1 each)		Reference point for index marks	NG if dirty (not scannable)
Block codes (30)	▪	Sheet information (memory card ID, page)	NG if dirty (not scannable)
Image marks (30 x 3)	●	Determines whether or not to print pixel	Use at least one of these marks
Paper type/Paper size (6)	●	Select paper	NG if dirty (not scannable)
Layout (2)	●	Select layout	NG if dirty (not scannable)
Date format	●	Date format On/Off	Optional

• When two or three marks of one image are filled, larger number will be used
  for the number of copies. (ex. 1 and 3 are filled, number of copies is 3.)
• When the optional "ALL" mark is filled, all images in the sheet will be
  printed one by one regardless of each image mark is filled or not.
• Index sheet error will be caused when any of image mark or "ALL" mark is
  not filled.
• Index sheet error will be caused when "Left and right edges", "Right top
  EPSON" and "Block codes" are not found correctly due to something like
  smear.
• Place the index sheet so that the "Left top triangle" can meet the left top
  corner of the scanner.

<OK/NG mark samples>

• The marks can be recognized if 50 % or more portion of each of them is
  filled.
• For running out and excessive marking out, the two white/black search
  patterns shown above are superimposed on the mark, and judgment is made
  according to this matching ratio. The judgment criteria is as follows.
  Black matching: 80 % or more White matching: 50% or more.

■   Errors during scanning or printing of index sheets

   • Stops scanning and returns to the menu screen if the card is removed while
     an index sheet is being scanned or printed.
   • Index sheet error (No index sheet) is displayed if the sheet cannot be
     scanned because it is dirty, set backwards, etc.
   • Index sheet error (Incorrect marking) is displayed if the image bubbles
     cannot be read because they are not filled in correctly.
   • Index sheet error (Incorrect card) is displayed if, after printing an index
     sheet, you try to print from a non-matching memory card, such as a different
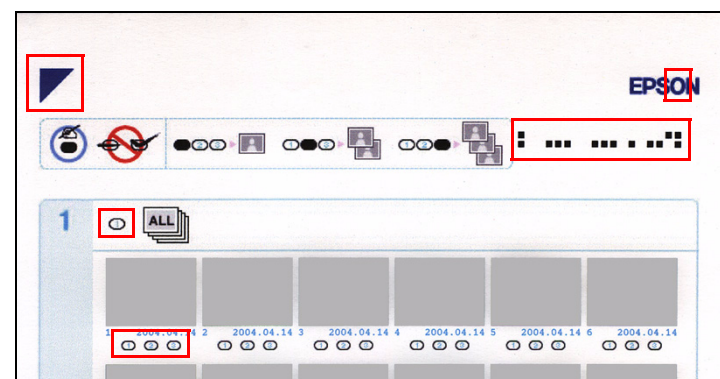   (replacement) card or a re-edited version of the same card.
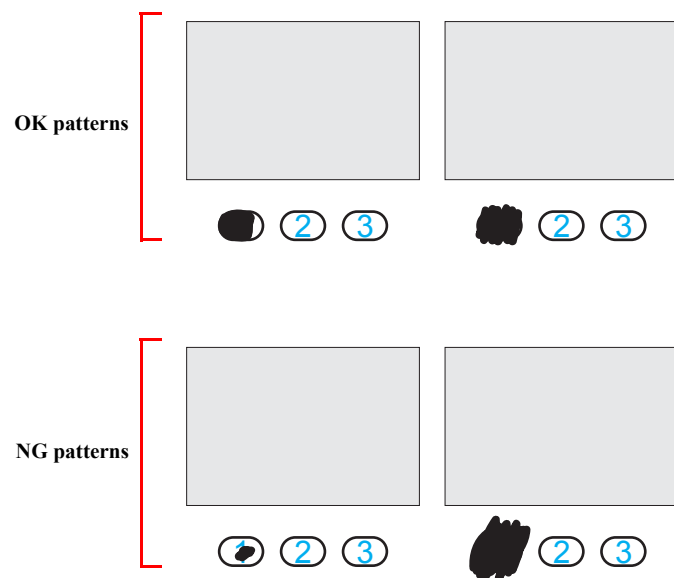

Figure 1-15. Symbols Check

OK patterns

NG patterns

Figure 1-16. OK/NG Mark Samples

1.5.4 Layout and Paper Type, Paper Size

The layout/paper type and size combinations that can be selected are listed below.

Table 1-39. Layout and Paper Type, Paper Size

Layout	Paper type	Paper size	Description
Border free	Photo Paper	EAI: Letter, 4 x 6, 5 x 7 Rest: A4, 10 x 15[*1], 13 x 18	Prints with no margins along top, bottom and both sides
1-up with borders	Plain Paper	EAI: Letter, 4 x 6, 5 x 7 Rest: A4, 10 x 15, 13 x 18	Prints with 3 mm margins along top, bottom and both sides
20-up	—	EAI: 4 x 6 Rest: 10 x 15	Prints 20 frames per page, laid out in 5 columns and 4 rows (For DPOF index print only)
30-up	—	EAI: 5 x 7 Rest: 13 x 18	Prints 30 frames per page, laid out in 6 columns and 5 rows (For DPOF index print only)
80-up	—	EAI: 4 x 6, 5 x 7 Rest: 10 x 15, 13 x 18	Prints 80 frames per page, laid out in 10 columns and 8 rows (For DPOF index print only)

Note *1:   The panel indictor only. The printer chalks the 10 x 15 format up to 4 x 6 format.

1.5.5 Options

The functions below will be available by marking to options on the index sheet.

☐   Prints all photos one by one shown on the index sheet.

1.5.6 Trimming Function

A trimming function is provided as a means of coordinating photo data with the types of photo frames handled by this unit. This function is always activated so that printing photo data is in shapes that fit these photo frames.
This function is described briefly below.
The printed photo frame and the photo to be printed are matched in length along one side and the photo is resized along the perpendicular side to fit the frame on that side. Any part of the photo that does not fit within the photo frame is trimmed away (not printed).

❑ The image below shows an example in which the photo data is aligned vertically with the photo frame.

These parts are trimmed.   **Photo frame (print area)**
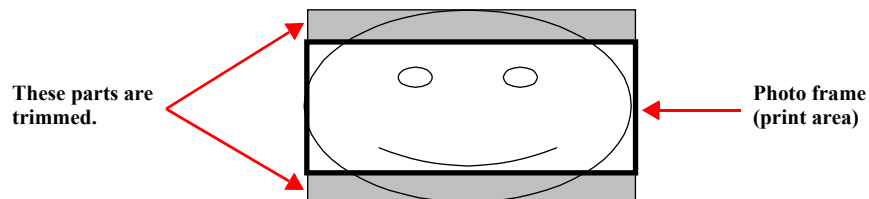
❑ The image below shows an example in which the photo data is aligned horizontally with the photo frame.

Photo frame (print area)

These parts are trimmed.
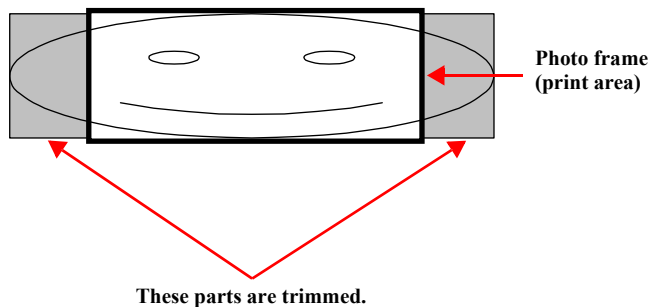
Figure 1-17. Trimming Function

1.5.7 Assignment Rules for Photo Frame Numbers and Rotation

The rules concerning photo frame numbers that are referred when assigning photos are described below. The numbers shown in each diagram and photo frame below indicate the photo frame numbers used for various types of layout.
The direction of the number shown in each photo frame matches the direction of the printed photo to which the horizontal photo data was allocated. When there are more pixels vertically than horizontally, the vertical photo data is allocated instead, and the number shown in the figure below is then rotated 90° before being printed. In Index printing mode, the numbers are printed as they are shown below, regardless of the shape of the photo data.
However, when the photo data has an equal number of pixels vertically and horizontally the photos are printed without rotation, regardless of the layout.
(Note: the vertical photo data refers to when the photo data file itself is set for a vertical (portrait) orientation. Photo data is defined as the vertical photo data if it is taken by a digital camera with a portrait position detecting function.)
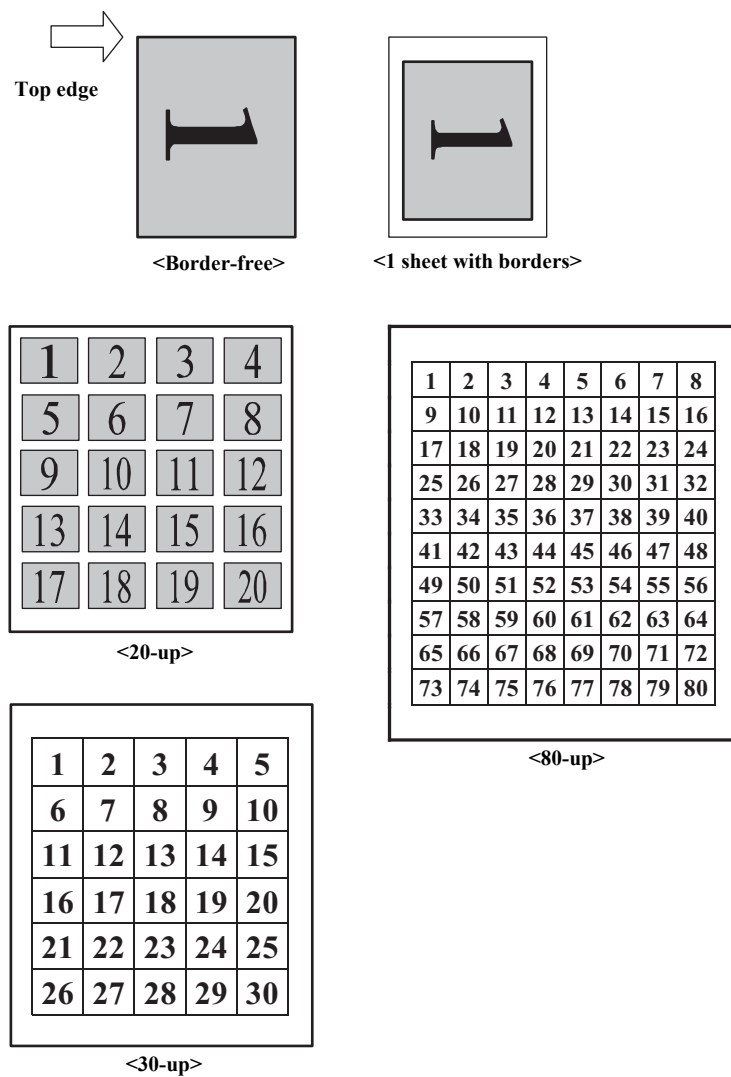
Top edge

<Border-free>   <1 sheet with borders>

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

<20-up>

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80

<80-up>

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30

<30-up>

Figure 1-18. Assignment Rules for Photo Frame Numbers and Rotation

1.5.8 Layout Drawings

1.5.8.1 Border Free
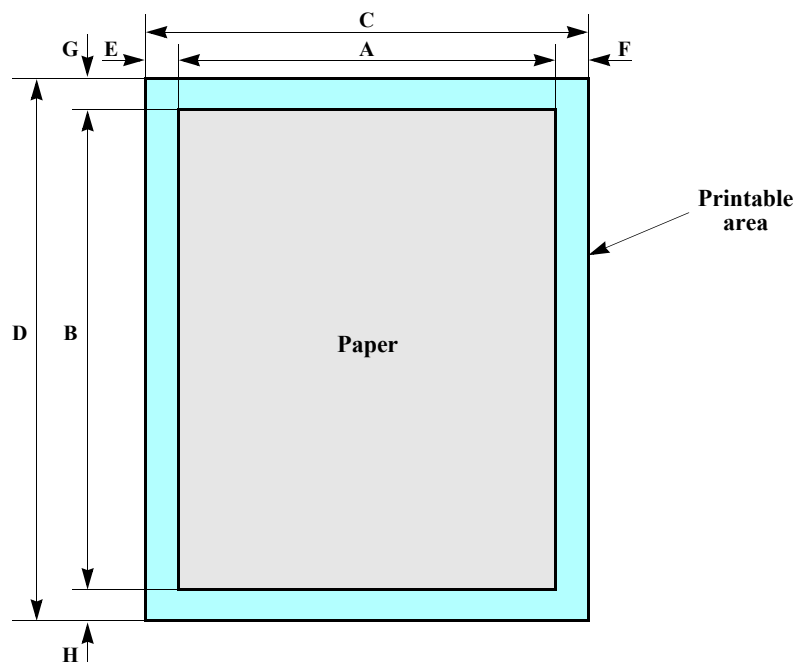
Figure 1-19. Border Free

Table 1-40. Border Free   **(unit: mm (inch))**

Paper type	A	B	C	D	E	F	G	H
Letter[*1]	215.90 (8.50)	279.40 (11.00)	220.98 (8.70)	287.53 (11.32)	2.54 (0.10)	2.54 (0.10)	2.96 (0.12)	4.02 (0.16)
4" x 6"[*1]	101.60 (4.00)	152.40 (6.00)	106.68 (4.20)	160.53 (6.32)	2.54 (0.10)	2.54 (0.10)	2.82 (0.11)	3.60 (0.14)
5" x 7"[*1]	127 (5.00)	178 (7.00)	132.08 (5.20)	186.04 (7.32)	2.54 (0.10)	2.54 (0.10)	2.96 (0.12)	4.02 (0.16)
A4[*2]	210	297	215.08	305.04	2.54	2.54	2.96	4.02
10 x 15[*2]	101.60	152.40	106.68	160.53	2.54	2.54	2.82	3.60
13 x 18[*2]	127	178	132.08	186.04	2.54	2.54	2.96	4.02

Note *1: Letter, 4" x 6", and 5" x 7" size will be used for Stylus CX4200/CX4800.

   *2: A4, 10cm x 15 cm, and 13cm x 18cm size will be used for Stylus CX4100/CX4700/ DX4200/DX4800/DX4850.

1.5.8.2 1-up with Borders
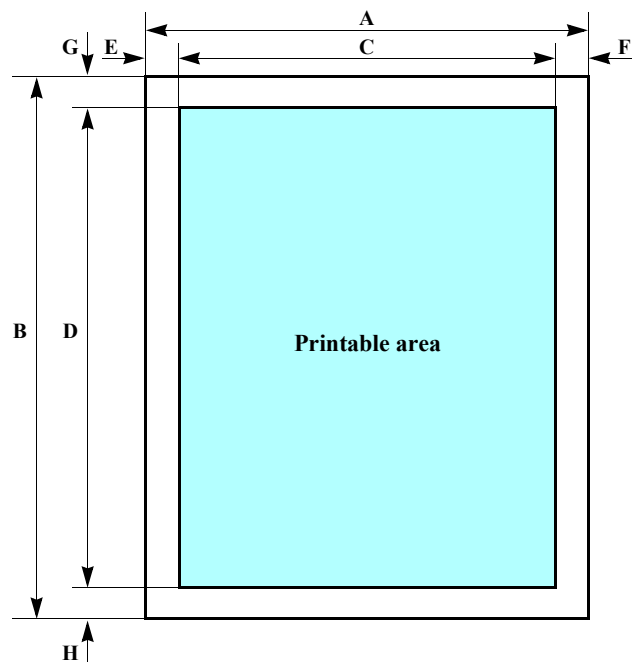
Figure 1-20. 1-up with Borders

Table 1-41. Border Free   **(unit: mm (inch))**

Paper type	A	B	C	D	E	F	G	H
Letter[*1]	215.90 (8.50)	279.40 (11.00)	209.90 (8.26)	273.40 (10.76)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)
4" x 6"[*1]	101.60 (4.00)	152.40 (6.00)	95.60 (3.76)	146.40 (5.76)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)
5" x 7"[*1]	127.0 (5.00)	178.0 (7.00)	121.0 (4.76)	172.0 (6.76)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)	3.00 (0.12)
A4[*2]	210	297	204	291	3.00	3.00	3.00	3.00
10 x 15[*2]	101.60	152.40	95.60	146.40	3.00	3.00	3.00	3.00
13 x 18[*2]	127.0	178.0	121.0	172.0	3.00	3.00	3.00	3.00

Note *1: Letter, 4" x 6", and 5" x 7" size will be used for Stylus CX4200/CX4800.

  *2: A4, 10cm x 15 cm, and 13cm x 18cm size will be used for Stylus CX4100/CX4700/ DX4200/DX4800/DX4850.

1.5.8.3 20-up
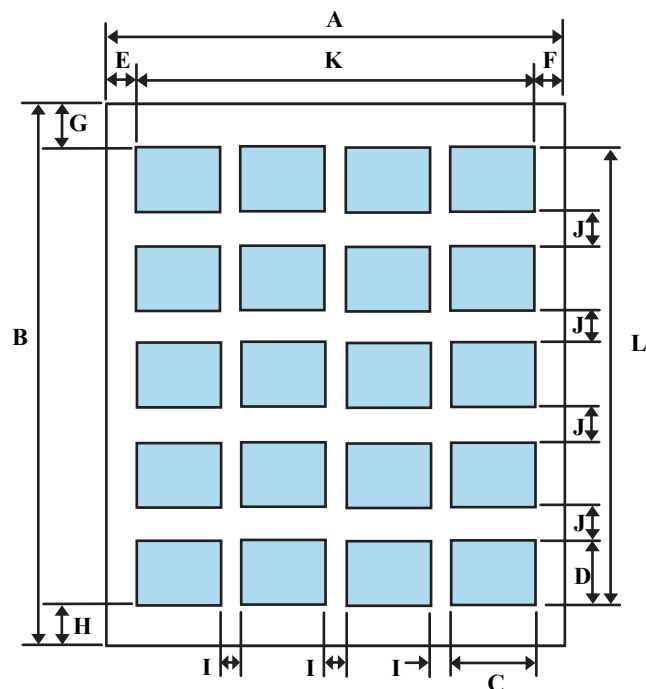
Figure 1-21. 20-up

Table 1-42. 20-up   (unit: mm (inch))

Paper type	A	B	C	D	E	F	G	H	I	J	K	L
4" x 6" *1	101.60 (4.00)	152.40 (6.00)	20.00 (0.79)	20.00 (0.79)	6.10 (0.24)	6.30 (0.25)	19.80 (0.78)	20.30 (0.80)	3.00 (0.12)	3.00 (0.12)	89.30 (3.52)	112.30 (4.42)
10cm x 15cm *2	101.60	152.40	20.00	20.00	6.10	6.30	19.80	20.30	3.00	3.00	89.30	112.30

Note *1:   4" x 6" size will be used for Stylus CX4200/CX4800.

*2:   10cm x 15 cm size will be used for Stylus CX4100/CX4700/ DX4200/DX4800/ DX4850.

1.5.8.4 30-up
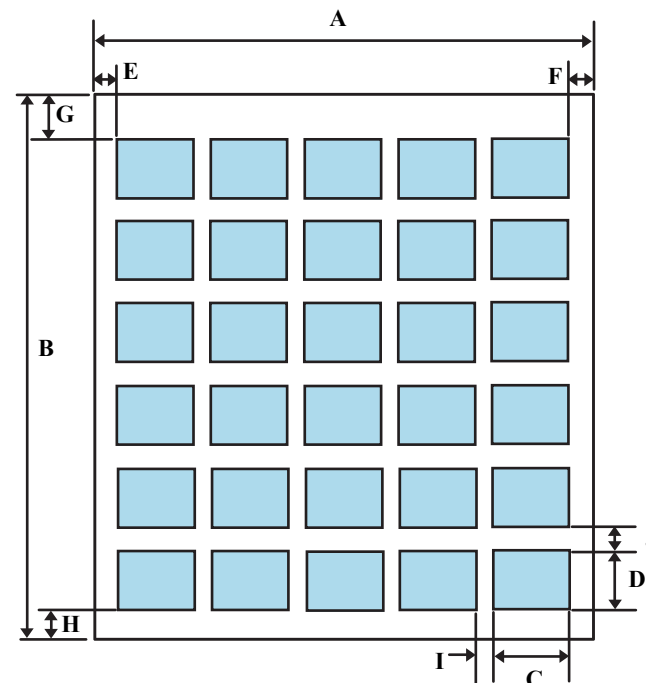
Figure 1-22. 30-up

Table 1-43. 30-up   (unit: mm (inch))

Paper type	A	B	C	D	E	F	G	H	I	J
5" x 7"*1	127.00 (5.00)	178.00 (7.00)	20.0 (0.79)	20.0 (0.79)	4.5 (0.18)	4.5 (0.18)	14.0 (0.55)	14.0 (0.55)	4.5 (0.18)	6.0 (0.24)
13 x 18*2	127.00	128.00	20.0	20.0	4.5	4.5	14.0	14.0	4.5	6.0

Note *1:   4" x 6" size will be used for Stylus CX4200/CX4800.

*2:   10cm x 15 cm size will be used for Stylus CX4100/CX4700/ DX4200/DX4800/ DX4850.

1.5.8.5 80-up
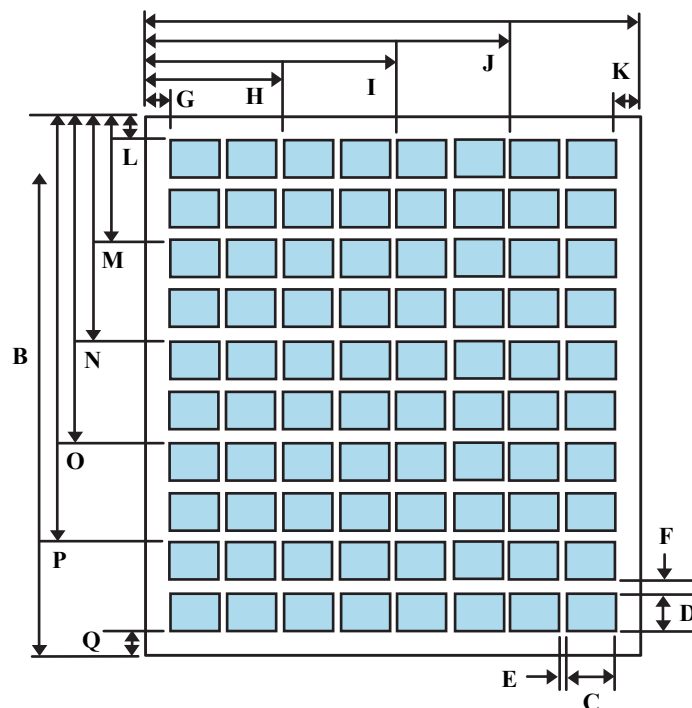
Figure 1-23. 80-up

Table 1-44. 80-up   **(unit: mm (inch))**

Paper type	A	B	C	D	E	F	G	H	I
Letter	215.90 (8.50)	279.40 (11.00)	20.07 (0.79)	20.07 (0.79)	6.10 (0.24)	6.10 (0.24)	6.35 (0.25)	58.67 (2.31)	111.00 (4.37)
A4	210.0	297.0	20.0	20.0	2.0	5.0	18.0	62.0	106.0

Paper type	J	K	L	M	N	O	P	Q
Letter	163.32 (6.43)	6.35 (0.25)	11.94 (0.47)	64.26 (2.53)	116.59 (4.59)	168.91 (6.65)	221.23 (8.71)	11.94 (0.47)
A4	150.0	18.0	26.0	76.0	126.0	176.0	226.0	26.0

1.5.9 Relation between Paper Type and Quality

In this mode, printing is always in color (CMYK), not black ink only.

Table 1-45. Relation between Paper Type and Quality

Paper type	Print resolution (H x V dpi)	Dot size	MW	High speed	LUT
Plain Paper	720 x 720	VSD3	On	On	1
Photo Paper	1440 x 720	VSD3	On	On	2
Index sheet (Plain Paper)	360 x 720	VSD1	On	On	4

1.6 Control Panel

1.6.1 Buttons

The control panel contains following 9 or 10 buttons, which are used to set and execute various operations.
All of them are non-lock type buttons.

Table 1-46. Buttons

Button	Function
Power Button	Execute turning on/off this unit.
Ink Button	Execute exchanging ink cartridges or head cleaning.
Memory Card Button *1	Make transition from "Copy mode" to "Memory Card mode" and selects one of card print mode.
Copy Button	Make transition from "Memory Card mode" to "Copy mode" and sets number of copies.
Paper Type Button	Select paper type.
Paper Size Button	Select paper size.
Fit to Page Button	Alternate zoom of "Fit to page" and default (actual; 100%).
B&W Start Button *2	Start monochrome copy.
Color Start Button	Start card print or color copy.
Stop Button	Stop job of copying or printing or sometimes work as shift button.

Note *1: Only for CX4700/CX4800/DX4800/DX4850.

   *2: B&W means "Black and White".

Refer to "1.6.3.1 Stand-alone Copy / Memory Card Print" *(p.49)* for details about each button.

1.6.2 Indicators

The control panel contains following 7-segment LED and 8 or 11 LEDs, which are used to indicate various status.

Table 1-47. Indicators

LED	Function
Power LED [Green] *5	Light at stand-by. Blink while some operation is proceeding.
Error LED [Red]	Light or blink while some error or warning is occurring.
Ink LED [Red]	Light when some ink is out. Blink when some ink is near empty or in the ink cartridge exchanging procedure.
Memory Card LED 1-3 *1	Light one of them while some memory card print function showing below is ready or proceeding.
1st [Green]	Print Index Sheet
2nd [Green]	Print From Index Sheet
3rd [Green] *3	Print All / DPOF
7-seg. LED *4	Indicate number of copies, or some error codes in error status.
Decimal Point LED	Blinks slowly in low power panel status.
Paper Type LED 1,2	Light one of them showing which paper type below is selected.
1st [Green]	Plain Paper
2nd [Green]	Photo Paper
Paper Size LED 1,2	Light one of them showing which paper size below is selected.
1st [Green]	A4 or Letter *2
2nd [Green]	10x15 or 4"x6" *2
Fit to Page LED [Green]	Light when "Fit to Page" function is effective in copy mode.
Card Access LED [Green] *6	Light when available memory card is in a slot. Blink when accessing to the card.

Note *1: Only for CX4700/CX4800/DX4800/DX4850.
   When Standalone Copy mode is selected, those LEDs are turned off.

   *2: Depending on its market. Letter and 4"x6" are for North and South America, and A4 and 10x15 are for other areas.

   *3: When DPOF printing is proceeding, this LED is blinking.

   *4: When Memory Card Print mode is selected, those LEDs are turned off.

   *5: All LEDs except for Power LED will be turned off while printing or scanning by PC.

   *6: This LED is located near the card slot, not on the control panel.
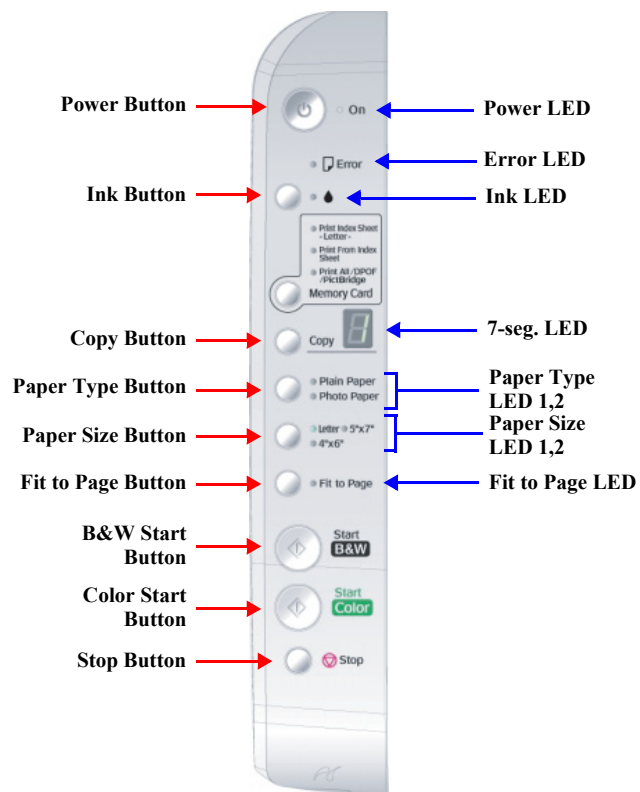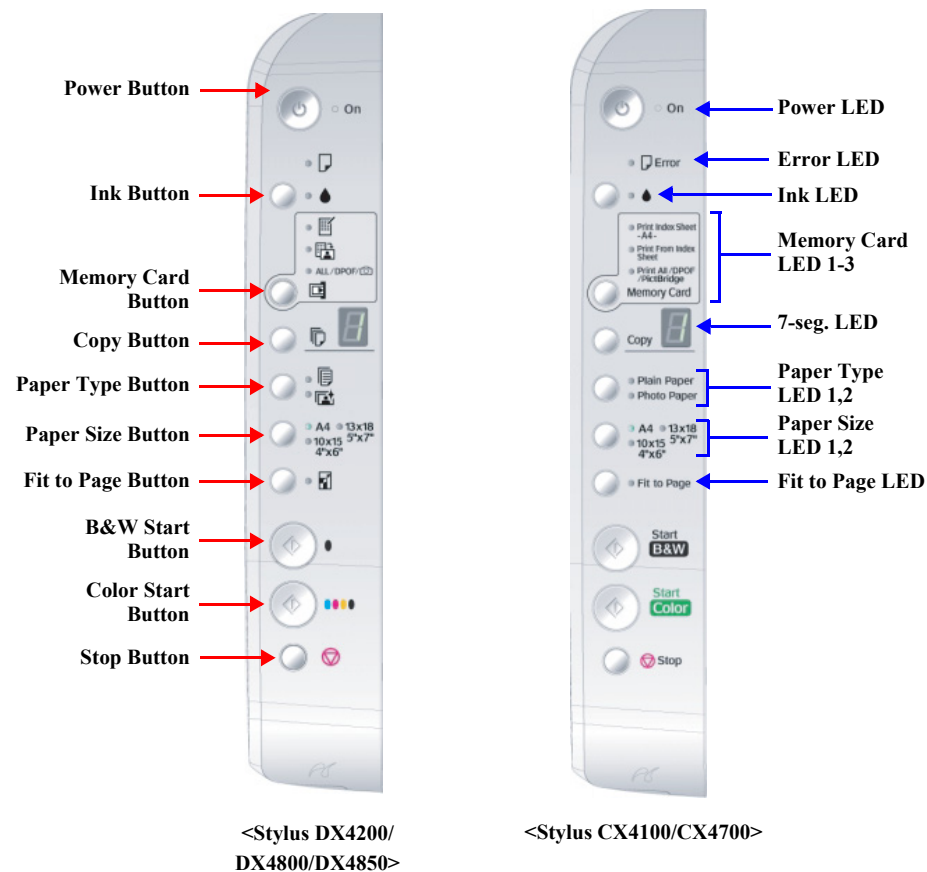
Figure 1-24. Control Panel (Stylus CX4200/CX4800)

<Stylus DX4200/
DX4800/DX4850>   <Stylus CX4100/CX4700>

Figure 1-25. Control Panel (Stylus CX4100/CX4700/DX4200/DX4800/DX4850)

1.6.3 Operations

1.6.3.1 Stand-alone Copy / Memory Card Print

The functions of this unit caused by each button in stand-alone copy mode or memory card print mode are described in the following table.

Table 1-48. Operations

Button	Function	
	Stand-alone Copy	**Memory Card Print (Only for CX4700/CX4800/DX4800/DX4850)**
Power Button	• Turn on or off this unit.	

Ink Button	• Start or advance ink cartridge (I/C) exchanging procedure.
	☐ Case
	  ■ [All inks are enough.] Move carriage (CR) to I/C exchange position.
	  ■ [Ink low, Ink out, Without I/C error] Move CR to each color's ink check position if that color's I/C is ink low or ink out or without I/C. CR moves in the order of Cyan, Magenta, Yellow, Black.
	  ■ [CR is in some color's ink check position.] Move CR to next color's ink check position or I/C exchange position.
	  ■ [CR is in I/C exchange position.] Move CR to standby position.
	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status except for ink out error, paper out error, memory card error, index sheet error, PG error.	

Ink Button (Holding over 3 sec.)	• Start cleaning head procedure. • Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status except for paper out error, memory card error, index sheet error, PG error.	

Memory Card Button (Only for CX4700/ CX4800/DX4800/ DX4850)	• Make transition from "Stand-alone copy" mode to "Memory card print" mode and select and light "Print Index Sheet", or "Print All / DPOF" if DPOF file exists in the card.
	• Turn off both 7-seg. LED and "Fit to Page" LED.
	• Select "Plain Paper" and "Letter (or A4)"
		• Change to next "Memory card print" function.
		☐ Case
		  ■ [Print Index Sheet] Change to "Print From Index Sheet", and change paper type and paper size to the one last set in "Print From Index Sheet" or "Print All / DPOF".
		  ■ [Print From Index Sheet] Change to "Print All / DPOF".
		  ■ [Print All / DPOF] Change to "Print Index Sheet", and change paper type and paper size to "Plain Paper" and "Letter (or A4)".

	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status except for memory card error, index sheet error, PG error.	

Copy Button	• Set number of copies incrementally and indicate it on 7-seg. LED.
	☐ Case
	  ■ [1 to 8] Add 1 and the number becomes 2 to 9.
	  ■ [9] Indicate "-", which means 100 copies.
	  ■ [-] Reset to "1".
	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status.
	• Number decreases one by one after 1 copy is finished and return to the beginning number when all copies are finished. When "-" is indicated, number of copies decreases internally but no change can be seen on 7-seg. LED.
		• Make transition from "Memory card print" mode to "Stand-alone copy" mode and set number of copies to "1".
		• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status except for memory card error, index sheet error, PG error.

Table 1-48. Operations

Button	Function	
	Stand-alone Copy	**Memory Card Print (Only for CX4700/CX4800/DX4800/DX4850)**
Paper Type Button	• Alternate paper type of "Plain Paper" and "Photo Paper".	• Alternate paper type of "Plain Paper" and "Photo Paper" which will be used in "Print From Index Sheet" or "Print All / DPOF". • Invalid in "Print Index Sheet", and then it is fixed to "Plain Paper".
	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status.	
Paper Size Button	• Alternate paper size of "Letter (or A4)" and "4"x6" (or 10x15)".	• Alternate paper size of "Letter (or A4)" and "4"x 6" (or 10x15)" which will be used in "Print From Index Sheet" or "Print All / DPOF". • Invalid in "Print Index Sheet", and then it is fixed to "Letter (or A4)".
	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status.	
Fit to Page Button	• Alternate "Fit to Page" status and turn on or off the "Fit to Page" LED. • Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in error status.	• Invalid. "Fit to Page" LED is always turned off in this mode.
B&W Start Button	• Start monochrome copy. • Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in ink out error. • Move to PG error status when platen gap is large. But when this button is pressed again in that status, that print will start.	• Invalid but for clearing some error status. • Clear PG error and start print that was suspended by PG error. • Clear index sheet error and start "Print from index sheet".
	• Load paper in paper out error or double feed error and eject paper in paper jam error.	
Color Start Button	• Start color copy.	• Start memory card print. • Make transition from "Print Index Sheet" to "Print From Index Sheet" when "Print Index Sheet" finishes successfully, without any error or "STOP" operation. • Invalid with no card in slots. • Move to memory card error status when incompatible memory card is inserted or no images found in the card.
	• Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in ink out error. • Load paper in paper out error or double feed error and eject paper in paper jam error. • Move to PG error status when platen gap is large. But when this button is pressed again in that status, that print will start.	
Stop Button	• Stop job of copying or printing and reset the number of copies to the beginning.	• Stop job of copying or printing.
	• Eject paper when paper exists or may exist in the paper path. • Invalid while PC scanning, cleaning head and exchanging I/C. • Clear some of error status.	
B&W Start Button + Stop Button	• Start draft monochrome copy when "Plain Paper" and "Letter (or A4)" are selected. • Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in ink out error, or without "Letter" or "A4" is selected. • Move to PG error status when platen gap is large.	
Color Start Button + Stop Button	• Start draft color copy when "Plain Paper" and "Letter (or A4)" are selected. • Invalid while printing, scanning, cleaning head, stopping printing or copying, exchanging I/C, or in ink out error, or without "Letter" or "A4" is selected. • Move to PG error status when platen gap is large.	

1.6.3.2 Memory Card Insertion/Ejection (Only for CX4700/CX4800/DX4800/DX4850)

The functions of this unit caused by memory card insertion or ejection are described in the following table.

Table 1-49. Memory Card Insertion/Ejection

Action	Function
Card Insertion	• Recognize the card and light Card Access LED if it is right. • The LED blinks while memory access occurs to the memory card. • The Power LED blinks during the card recognition. • Return from the low power panel mode.
Card Ejection	• Turn off Card Access LED. • Stop print job while memory card print is in process and eject paper. • Clear memory card error if memory card is wrong.

1.6.3.3 Low Power Panel Mode

Without any panel operation for 15 minutes while the printer and scanner unit are in standby status, this unit moves into the low power panel mode in which power consumption for the panel decreases.
This unit recovers from that mode by pushing any button but Power Button or printing/scanning by the computer.
This unit is turned off by pushing Power Button in that mode.

Table 1-50. Low Power Panel Mode

Action	Function
Transition to low power mode	• Turn off all LEDs except for Power LED and Card Access LED. • Blink Decimal Point LED slowly. • No move in error status except for memory card error, index sheet error and PG error. • Ejecting of memory card or accessing it by PC has no effect on low power mode.
Recovery from low power mode	• Recall the panel status as that before moving to low power panel mode. • Inserting or ejecting of memory card or accessing it by PC has no effect on low power mode.

1.6.3.4 Adjust Lever Function

Without any panel operation for 15 minutes while the printer and scanner unit are in standby status, this unit moves into the low power panel mode in which power consumption for the panel decreases.
This unit recovers from that mode by pushing any buttons or printing/scanning by PC.

Table 1-51. Adjust Lever Function

Adjust lever status	Function
PG open (Displayed "H")	• "H" will be displayed with 7-seg.LED for about 3 seconds just after the adjust lever is changed to "H: Envelope" position.
PG close (Displayed "L")	• "L" will be displayed with 7-seg.LED for about 3 seconds just after the adjust lever is changed to "L: Cut sheet" position. • Clear the PG error and print job suspended by PG error when the adjust lever is changed to "L: Cut sheet position" in the PG error status.

1.6.3.5 Nozzle Check Pattern Print

Nozzle check pattern can be printed only with this unit. Left ink quantity of each color is also printed by the unit of 10%.
To activate this function, turn on this unit while depressing Ink Button. After printing the pattern, this unit moves to ordinary standby status.
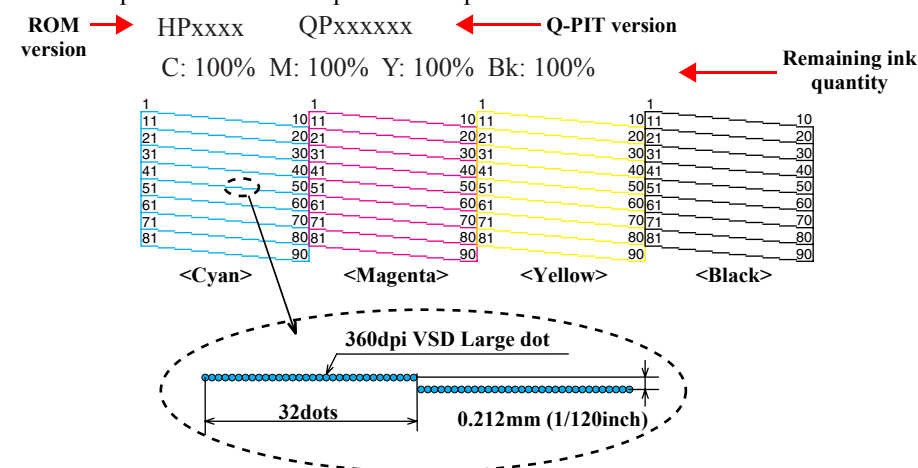The example of nozzle check pattern is explained below.

Figure 1-26. Nozzle Check Pattern

1.6.3.6 Head Alignment Adjustment

Alignment adjustments can be made to maintain high print quality during bi-directional printing. This function can be used for basic adjustments. For more precise adjustments, we recommend using the head alignment utility that is installed in the connected computer.
To activate this function, turn on this unit while depressing Copy mode button. The pattern will be printed which shows the head alignment at that time, and adjustment can be done regarding to that pattern.

☐ Procedure

- Preparation

    1. Set A4 or Letter sized paper to the sheet feeder.
    2. Set PG position is close (L).

- Print Pattern

    1. Turn on this unit while depressing Copy button.
    2. Alignment adjustment pattern is printed.

- Adjust VSD1 color parameter

    1. VDS1 color parameter is ready to adjust while "Plain Paper" LED is ON.
    2. Select the most appropriate value regarding the printed pattern #1 by pressing Copy button.
       The initial value is "5" indicated on 7-seg. LED and by pressing Copy button, the value will change from "1" up to "9" incrementally and cyclically.
    3. Press B&W Start button to terminate VSD1 color parameter adjustment. Just press that button as well when the initial value is the most appropriate.

- Adjust VSD2 color parameter

    1. VSD2 color parameter is ready to adjust while "Photo Paper" LED is ON.
    2. Select the most appropriate value regarding the printed pattern #2 by pressing Copy button.
       The initial value is "5" indicated on 7-seg. LED and by pressing Copy button, the value will change from "1" up to "9" incrementally and cyclically.

    3. Press B&W Start button to terminate VSD2 color parameter adjustment. Just press that button as well when the initial value is the most appropriate.

- Adjust VSD3 color parameter

    1. VSD3 color parameter is ready to adjust while "Letter (or A4)" LED is ON.
    2. Select the most appropriate value regarding the printed pattern #3 by pressing Copy button as VSD1, VSD2 parameters.
    3. Press B&W Start button to terminate that adjustment as VSD1 color parameters.

- Adjust Eco color parameter

    1. Eco color parameter is ready to adjust while "4"x 6" (or 10 x 15)" LED is ON.
    2. Select the most appropriate value regarding the printed pattern #4 by pressing Copy button as VSD1, VSD2 parameters.
    3. Press B&W Start Switch to terminate that adjustment as VSD1, VSD2 parameters.

- Termination

    1. VSD1, VSD2, VSD3, and Eco parameter adjustment is terminated successfully, the adjusted value will be memorized and this unit will be turned off automatically. The adjusted value will be effective from next turning on.
    2. To indicate the adjusted values are memorized, all the LEDs except for Card Access LED will be flashing once.

CHECK POINT ✔

- The adjustment procedure will be terminated unsuccessfully in the following cases and no adjustment will be done.
  1. Some error like Paper Out, Paper Jam, PG Open has occurred.
  2. The procedure is terminated by pressing Stop button.
  3. The unit is turned off.

  When Paper Out has occurred, the procedure can restart from "Print Pattern" by pressing Color Start button. The error should be removed in advance.
- Ink maintenance operation like "exchanging I/C" or "cleaning head" can not be done in this mode.
- This unit will be turned off automatically when the procedure is terminated by pressing Stop button and when PG open error has occurred and then the adjust lever has been set to close position.

1.6.4 Printer Condition and Panel Status

Note : "---":   No change
      Blink: 0.5sec. On + 0.5sec. Off repetition
      Blink 2:   0.2sec. On + 0.2sec. Off + 0.2sec. On + 0.4sec. Off repetition
      Blink 3:   Blink on and off along with access to a memory card
      Reverse blink:0.5sec. Off + 0.5sec. On repetition (opposite of "Blink")
      Fast blink: 0.2sec. On + 0.2sec. Off repetition
      Slow blink: 2.0sec. On + 2.0sec. Off repetition

Note *1:   When the setting is "On".

    *2:   After finishing copying, the counter returns to the preset number of copies.

Table 1-52. Printer Condition and Panel Status

Printer status	Indicators														Priority
	Power LED	Error LED	Ink LED	Memory Card LED			7-seg. LED	Paper Type LED		Paper Size LED			Fit to Page LED	Card Access LED	
				1	2	3		1	2	1	2	3			
Power on (Normal ready mode)	On	—	—	—	—	—	—	—	—	—	—	—	—	—	24
Card printing mode (Print All/DPOF)	—	—	—	—	—	On	Off	Selected type is On		Selected size is On			Off	—	23
Card printing mode (Index Sheet scanning & printing)	—	—	—	—	On	—	Off	Selected type is On		Selected size is On			Off	—	
Card printing mode (Print index sheet)	—	—	—	On	—	—	Off	On	—	On	—	—	Off	—	
Copying mode	—	—	—	Off	Off	Off	Displays copy numbers. Displays "-" for continuous copy of 20 pages or more.	Selected type is On		Selected size is On			On (if the setting is on)	—	
DSC direct mode	—	—	—	—	—	On	"P" blink	Selected type is On		Selected size is On			Off	—	
Ink low	—	—	Blink	—	—	—	—	—	—	—	—	—	—	—	22

Table 1-52. Printer Condition and Panel Status

Printer status	Indicators														Priority
	Power LED	Error LED	Ink LED	Memory Card LED			7-seg. LED	Paper Type LED		Paper Size LED			Fit to Page LED	Card Access LED	
				1	2	3		1	2	1	2	3			
PG lever operation (Standard: "L")	—	—	—	—	—	—	"L" blink 2 (3 sec.)	—	—	—	—	—	—	—	21
PG lever operation (Large: "H")	—	—	—	—	—	—	"H" blink 2 (3 sec.)	—	—	—	—	—	—	—	
PG error	—	Blink 2	—	—	—	—	"H" blink 2	—	—	—	—	—	—	—	
Index sheet error (Index sheet contents)	—	Blink 2	Off	—	Blink 2	—	"3" blink 2	—	—	—	—	—	—	—	20
Index sheet error (Memory card mismatch)	—	Blink 2	Off	—	Blink 2	—	"4" blink 2	—	—	—	—	—	—	—	19
Index sheet error (Incorrect placement)	—	Blink 2	Off	—	Blink 2	—	"2" blink 2	—	—	—	—	—	—	—	18
Memory card error	—	Blink 2	Off	Blink 2	Blink 2	Blink 2	"1" blink 2	Off	Off	Off	Off	Off	Off	—	17
Power on (Data Processing)	Blink	—	—	—	—	—	—	—	—	—	—	—	—	—	16
Reading a memory card (recognizing image data)	Blink	—	—	—	—	—	—	—	—	—	—	—	—	—	15
Stopping printing and cancelling the print job	Blink	—	—	—	—	—	—	—	—	—	—	—	—	—	14
The scanner is operating by a computer	Blink	—	—	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	—	13
Printing by a computer	Blink	—	—	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	—	

Table 1-52. Printer Condition and Panel Status

Printer status	Indicators													Priority
	Power LED	Error LED	Ink LED	Memory Card LED			7-seg. LED	Paper Type LED		Paper Size LED			Fit to Page LED	Card Access LED	
				1	2	3		1	2	1	2	3			
DSC direct printing	Blink	—	—	—	—	On	"P" blink	Selected type is On		Selected type is On			Off	—	12
Copying	Blink	—	—	Off	Off	Off	Number of copies remaining* Displays "-" for continuous copy of 20 pages or more.	Selected type is On		Selected type is On			On (if the setting is on)	—	
Card printing (DPOF)	Blink	—	—	—	—	On	Off	Selected type is On		Selected size is On			Off	—	
Card printing (Print All)	Blink	—	—	—	—	On	Off	Selected type is On		Selected size is On			Off	—	
Card printing (Index Sheet scanning & printing)	Blink	—	—	—	On	—	Off	Selected type is On		Selected size is On			Off	—	
Card printing (Print index sheet)	Blink	—	—	On	—	—	Off	On	—	On	—	—	Off	—	
Double feed	—	On	Off	—	—	—	—	—	—	—	—	—	—	—	11
Paper out	—	On	Off	—	—	—	—	—	—	—	—	—	—	—	
Ink Sequence Processing	Blink	—	—	—	—	—	—	—	—	—	—	—	—	—	10
Ink Cartridge Change Mode	Blink 2	Off	Blink 2	—	—	—	—	—	—	—	—	—	—	—	9
Ink out/No Ink cartridge/ Read error/Write error	—	Off	On	—	—	—	—	—	—	—	—	—	—	—	8
Paper jam	—	Blink	Off	—	—	—	—	—	—	—	—	—	—	—	7
Reset request/Stop request/Job cancel request (1 second)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	On (1 sec.)	—	On (1 sec.)	—	6
DSC direct error	—	Blink 2	Off	Off	Off	Off	"P" blink 2	—	—	—	—	—	—	—	
Power on (Initializing operation)	Blink	—	—	—	—	—	—	—	—	—	—	—	—	—	5

Table 1-52. Printer Condition and Panel Status

Printer status	Indicators														Priority
	Power LED	Error LED	Ink LED	Memory Card LED			7-seg. LED	Paper Type LED		Paper Size LED			Fit to Page LED	Card Access LED	
				1	2	3		1	2	1	2	3			
Maintenance request (Liquid waste overflow)	Blink	On	On	Blink	Blink	Blink	"E" blink	Blink	Blink	Blink	Blink	Blink	Blink	—	4
Fatal error (Mechanism)	Blink	Blink	Blink	Blink	Blink	Blink	"E" blink	Blink	Blink	Blink	Blink	Blink	Blink	—	3
Fatal error (System)	Fast blink	Fast blink	Fast blink	Fast blink	Fast blink	Fast blink	Fast "E" blink	Fast blink	Fast blink	Fast blink	Fast blink	Fast blink	Fast blink	—	2
Power off (Processing termination)	Fast blink	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	—	1

Note "*": Returns to the preset number when the copying is finished.

1.6.4.1 Error Status

☐ **Mechanical fatal error**
This error occurs when one of the followings happens.

- The carriage could not recognize the home position.
- The carriage is put an unusual external force when the power is on.
- The movement of the carriage is obstructed during printing.

☐ **Paper jam error**
The printer fails to detect either the leading edge or back-end of the paper after performing paper feeding for specified number of times.

☐ **Paper out error**
This error occurs when one of the followings happens.

- There is no paper on the tray.
- Paper has stopped before the PE sensor, or paper could not be fed correctly.
- Papers are set without setting their edges against the right edge guide.

☐ **Ink end**
There is no ink remaining in the installed Bk, Y, M, or C cartridge(s), or ink cartridge(s) is not installed.

☐ **Liquid waste overflow**
Amount of ink discharged while cleaning or flushing has exceeded the given level.

☐ **Double feed error**
This error only occurs when performing duplex printing. There are two following cases:

- Blank paper is ejected when loading papers.
- The length of the paper is determined to be long when ejecting the paper.

1.6.5 Memory Functions

1.6.5.1 Parameters that are retained while mode transition

The following parameters are retained for each mode while the mode transition from "Copy" mode to "Memory Card Print" mode or vice versa.

☐ "Paper Type" and "Paper Size" are retained for each mode as default.

☐ Zoom is retained for "Copy" mode as default.

NOTE: Paper Type and Paper Size are commonly used in "Print From Index Sheet" and "Print All / DPOF".

1.6.5.2 Parameters that are retained when power is turned off

The following parameters are retained when the unit's power is off. They are listed along with the corresponding memory functions in the table below.

☐ Copy mode is selected when this unit is turned on apart from the mode when it was turned off before.

☐ Paper Type and Paper Size are retained for each mode as default.

☐ Zoom is retained for copy mode as default.

Table 1-53.

Mode	Parameter retained in memory	Factory setting
Copy	Paper Type	Plain Paper
	Paper Size	Letter or A4
	Zoom (The status of Fit to Page)	100% (OFF)
Memory Card Print (Only for CX4700/CX4800/ DX4800/DX4850)	Paper Type	Photo Paper
	Paper Size	4"x 6" or 10x15[*1]

Note *1:   The panel indicator only. The printer chalks 10 x 15 format up to 4 x 6 format.

1.6.6 Printer Initialization (TBD)

There are four kinds of initialization method, and the following explains each initialization.

1. Power-on initialization
    This printer is initialized when turning the printer power on, or printer recognized
    the cold-reset command (remote RS command).
    When printer is initialized, the following actions are performed.
    (a) Initializes printer mechanism
    (b) Clears input data buffer
    (c) Clears print buffer
    (d) Sets default values

2. Operator initialization
    This printer is initialized when turning the printer power on again within 10
    seconds from last power off, or printer recognized the -INIT signal (negative
    pulse) of parallel interface.
    When printer is initialized, the following actions are performed.
    (a) Cap the printer head
    (b) Eject a paper
    (c) Clears input data buffer
    (d) Clears print buffer
    (e) Sets default values

3. Software initialization
    The ESC@ command also initialize the printer.
    When printer is initialized, the following actions are performed.
    (a) Clears print buffer
    (b) Sets default values

4. Power-on initialization except I/F
    The printer recognized the IEEE 1284.4 "rs" command.
    When printer is initialized, the following action is performed.
    (a) Initializes printer mechanism
    (b) Clears input data buffer
    (c) Clears print buffer
    (d) Sets default values except I/F

OPERATING PRINCIPLES

2.1 Overview

This section describes the operating principles of the Printer Mechanism, Scanner Mechanism and Electrical Circuit Boards.

☐   Main Board

   ◼   C610 Main Board

☐   Power Supply Board

   ◼   C610 PSB/PSE Board

☐   Panel Board

   ◼   C571 PNL Board (Stylus CX4700/CX4800/DX4800/DX4850)

   ◼   C577 PNL Board (CX4100/CX4200/DX4200)

☐   I/F Board

   ◼   C610 I/F Board

2.2 Printer Mechanism

2.2.1 Printer Mechanism

This printer consists of the Print Head, Carriage Mechanism, Paper Loading Mechanism, Paper Feeding Mechanism, Ink System.
Like the previous printers, Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850 is equipped with two DC motors; one for the Paper Loading/Feeding Mechanism and the Pump Mechanism with the CR Lock Mechanism, and one for the CR Mechanism. The ASF Unit for the Paper Loading Mechanism uses rear entry front eject system. The Paper Feeding Mechanism uses the LD Roller and Retard Roller to feed paper to the Printer Mechanism in the same way as previous printers.
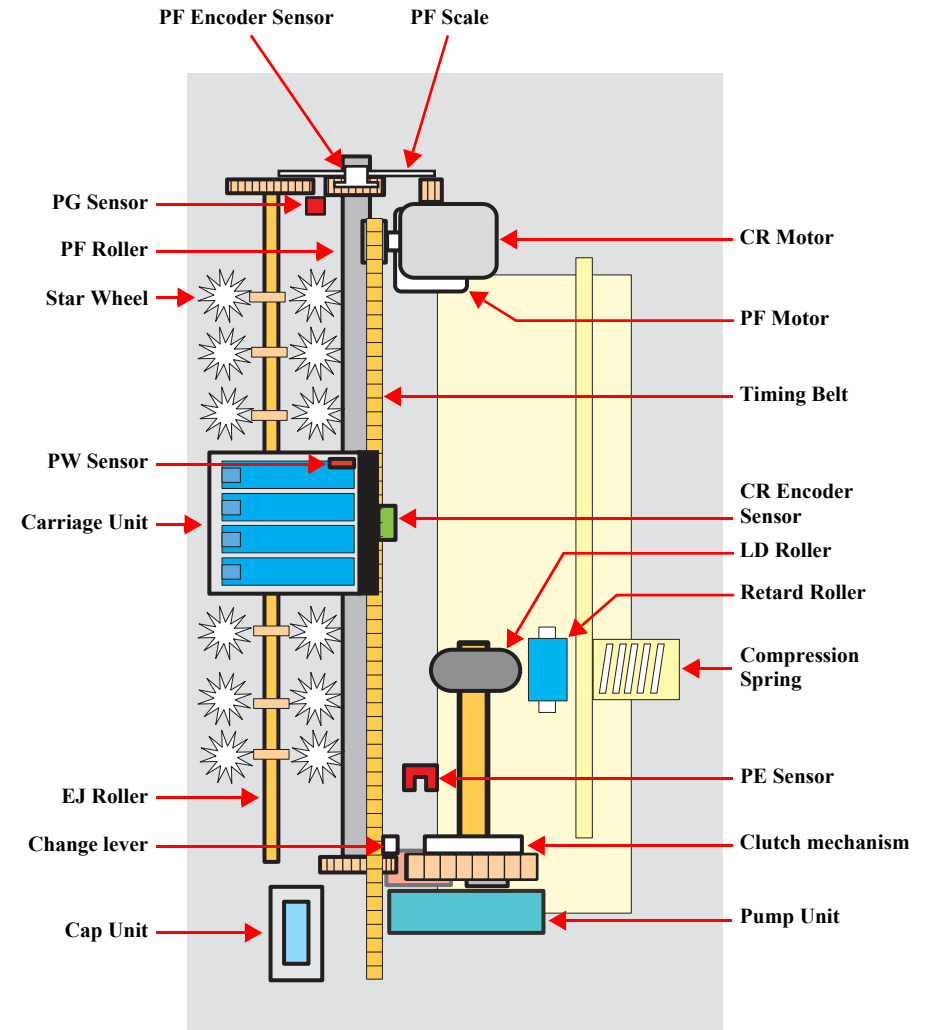
Figure 2-1. Printer Mechanism block diagram

2.2.2 Print Head

The Print Head is the same D4-CHIPS type as the previous SPC and makes it possible to perform economy dot printing and variable dot printing.
The Print Head nozzle configuration is as follows.

□ Nozzle layout

  ■ Black: 90 nozzles x 1 row

  ■ Color: 90 nozzles x 3 row/color (Cyan, Magenta, Yellow)

The nozzle layout when viewed from the back surface of the Print Head is shown below.
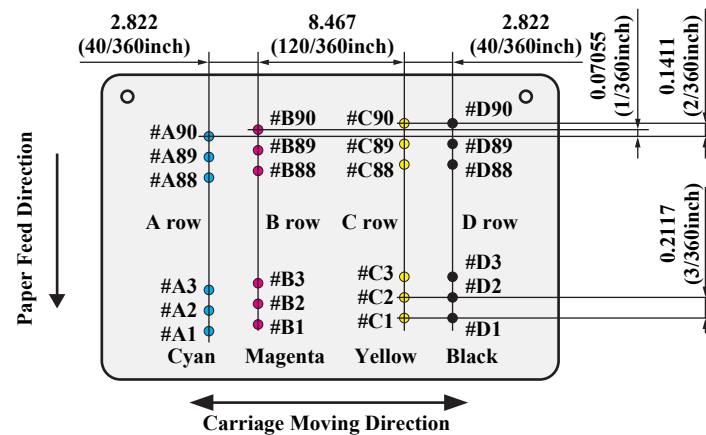
Figure 2-2. Nozzle layout

The Print Head has the Electric Poles (CSIC Connectors) to store the ink consumption amount data into the CSIC chip mounted on the Ink Cartridge. By storing the ink consumption amount data, this printer can detect the ink consumption status, such as Ink Low/Out condition.

The basic operating principles of the Print Head, which plays a major role in printing, are the same as the previous printer; on-demand method which uses PZT (Piezo Electric Element). In order to uniform the ejected ink amount, the Print Head has its own Head ID (13-digits code for this Print Head for Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850) which adjusts PZT voltage drive features. So, you are required to store the Head ID pasted on the Print Head into the EEPROM by using the Adjustment Program when replacing the Print Head, the Main Board Unit, the Printer Mechanism with new one. (Note: there are no resistor arrays to determine the Head ID on the Main Board.) And then, based on the stored Head ID into the EEPROM, the Main Board generates appropriate PZT drive voltage.

Following explains the basic components for the Print Head.

□ PZT
   PZT is an abbreviation of Piezo Electric Element. Based on the drive waveform generated on the Main Board, the PZT selected by the nozzle selector IC on the Print Head pushes the top of the ink cavity, which has ink stored, to eject the ink from each nozzle on the nozzle plate.

□ Electric poles for CSIC
   This Electric Poles connects the CSIC chip mounted on the Ink Cartridge. By using this poles, current ink consumption amount data is red out from the CSIC chip. And, the latest ink consumption amount data is written into the CSIC chip.

□ Nozzle Plate
   The plate with nozzle holes on the Print Head surface is called Nozzle Plate.

□ Filter
   When the Ink Cartridge is installed, if any dirt or dust around the cartridge needle is absorbed into the Print Head, there is a great possibility of causing nozzle clog and disturbance of ink flow, and alignment failure and dot missing finally. To prevent this problem, a filter is set under the cartridge needle.

❑ Ink Cavity
  The ink absorbed from the Ink Cartridge goes through the filter and then is stored temporarily in this tank called "ink cavity" until PZT is driven.
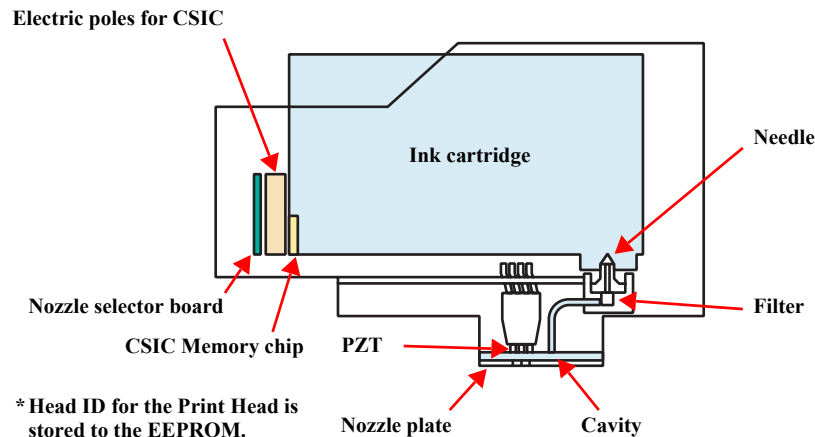
Figure 2-3. Printhead sectional drawing

2.2.2.1 Printing Process

This section explains the process which the Printheads of On-Demand inkjet printers eject ink from each nozzle.

1. **Normal state:**
   When the printing signal is not output from the Main Board (C610 Main), or the PZT drive voltage is not applied, the PZT does not change the shape. Therefore, the PZT does not push the ink cavity. The ink pressure inside the ink cavity is kept normal. (refer to Figure 2-4 *(p.63)*: Normal state)

2. **Ejecting state:**
   When the print signal is output from Main Board (C610 Main), the nozzle selector IC located on the Print Head latches the data once by 1-byte unit. Based on the drive waveform (common voltage) generated on the Main Board, the PZT selected by the nozzle selector IC pushes the top of the ink cavity. By this operation, the ink stored in the ink cavity is ejected from nozzles. (refer to Figure 2-4 *(p.63)*: Ejecting state)
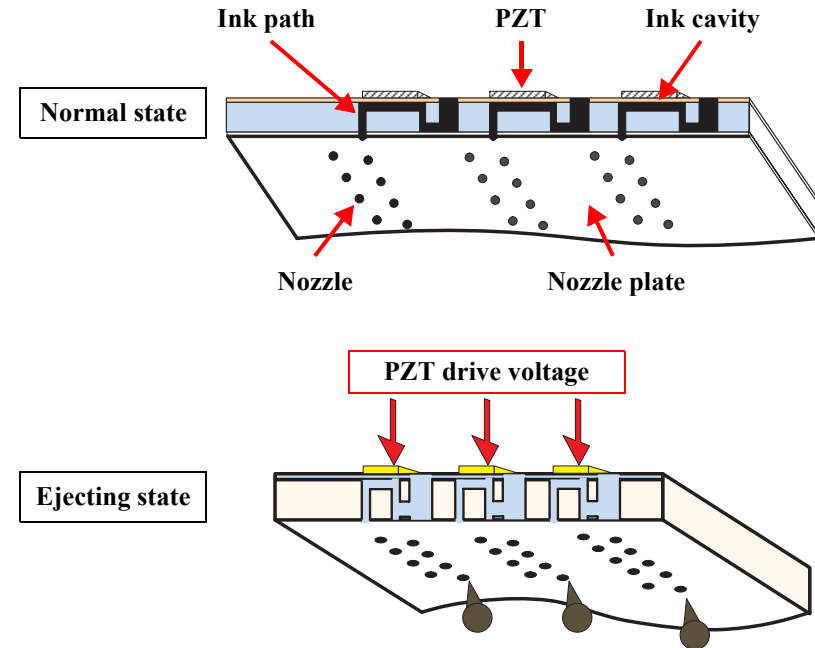
Figure 2-4. Print Head printing process

2.2.2.2 Printing Method

The dot printing systems of Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850 are variable dot printing systems.

❑ Variable dot printing
  This printing mode is developed to improve the print quality on exclusive paper. This mode is basically the same as variable dot printing mode used on other products; micro dot, middle dot and large dot compose this mode. The printing dot size varies according to the print data and this mode enables to output even sharper image on exclusive paper.

2.2.3 Carriage Mechanism

The Carriage Mechanism consists of Carriage Unit (including the Print Head, CR Encoder Board and PW Sensor), CR Motor, Timing Belt and CR Scale etc. Following figure shows you each component for the CR Mechanism.

2.2.3.1 Carriage Mechanism

The following DC motor controls the CR Mechanism on this printer.

Table 2-1. Carriage Motor specification

Items	Specifications
Type	DC motor with brushes
Drive Voltage	42V (DC) ± 5% (voltage applied to driver)
Armature resistance	29.1 Ω ± 10%
Inductance	20.1mH ± 25%
Drive Method	PWM, constant-current chopping
Driver IC	A6627

Close loop control based on the CR Motor (DC Motor) and CR Encoder has advantages in stabilized print quality.

❑ Heat generation control
  Using low-cost DC motors, this product grasps the variations of the torque constants, coil resistances and power supply voltages of the individual DC motors adequately to carry out heat generation control according to individual differences.

❑ CR variation measurement sequence
  The variations of the torque constant, coil resistance and power supply voltage of the motor are measured in a CR variation measurement sequence when the CR mechanical load is in the initial status and saved into the EEPROM. According to the variations (individual differences) measured in this sequence, the voltage is corrected to make the drive current value constant (without an individual difference).

❑ CR measurement sequence
  To set the appropriate drive current value according to the variation of the CR mechanical load, the mechanical load is measured in a CR measurement sequence and saved into the EEPROM in a power-on or I/C change sequence. A fatal error will occur if too much load is applied to the CR drive system.

The above control and sequences correct the drive current value of the CR Motor according to not only the mechanical load but also the variations of the motor and like. In addition, the resultant CR drive current value is used to calculate a heating value, and when the specified heating value is reached, wait time is provided per CR path for printing.
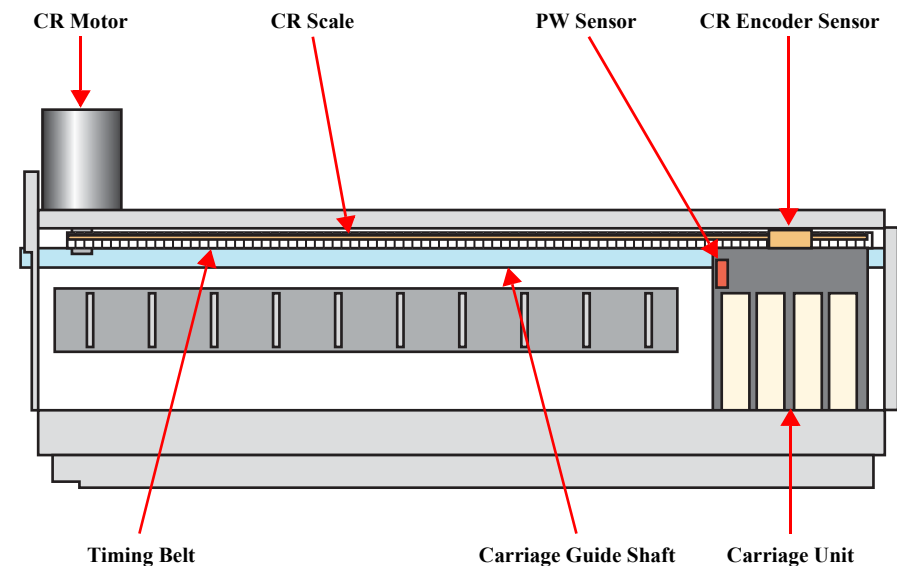
Figure 2-5. Carriage Mechanism

2.2.3.2 Carriage Home Position Detection

1. Current position temporary detection sequence determines if the carriage is in the carriage lock position and releases the carriage if it is locked.

2. The carriage is moved to the left frame hit position and the carriage motor is stopped.

3. The position that is specified steps right from the stopping place is defined as an origin, and from that time, positional information is monitored by the linear encoder.

If the positional information could not be gained during detecting carriage home position due to the following causes, fatal error occurs.

   • Obstructions on the carriage path or other factors are giving too much pressure on the CR motor.
   • CR linear encoder failure, CR linear scale defect, etc.

2.2.3.3 Sequence Used for PW Detection

The PW (paper width detection) Sensor installed on the Carriage Unit bottom is used to control the printer according to various sequences.

The following briefly describes the PW Sensor operating principle.

A dark voltage is measured by the PW Sensor in three places on the right end plane (area without the absorber) of the Front Paper Guide every time power is switched on, and the measurement values are saved into the EEPROM as threshold values.

   ■ Threshold value > detection voltage: Paper present

   ■ Threshold value < detection voltage: Paper absent

The following sequences are performed.

☐ Paper Left/Right Edge Detection Control
Before start of printing (immediately after the end of paper locating), or during printing, whether paper is present or not is detected to prevent off-paper printing on the Paper Guide by borderless printing used in a wrong way.

☐ Paper Top Edge Detection Control
Detects paper leading edge at start of printing. Also sets the amount of extension for the paper leading edge during borderless printing.

☐ Paper Bottom Edge Detection Control
Sets the amount of extension for the paper trailing edge during printing.

2.2.4 Paper Loading/Feeding Mechanism

The following DC motor controls the Paper loading/feeding mechanism on this printer.

Table 2-2. PF Motor specifications

Item	Description
Motor type	DC motor with brushes
Drive voltage	42V (DC) ± 5% (voltage applied to driver)
Armature resistance	27.5Ω ± 10%
Inductance	21.4mH ± 25%
Driving method	PWM, constant-current chopping
Driver IC	A6627

The drive of the PF motor is transmitted to the LD roller shaft and the PF roller through gears for the Paper loading/feeding mechanism. The Paper loading mechanism plays a role in loading a paper from the ASF unit to the PF roller. And also, the Paper feeding mechanism plays a role in feeding a paper loaded from the ASF unit. The functions of the Paper loading/feeding mechanism varies depending on the rotational direction of the PF motor as the table below.

Table 2-3. ASF unit function & PF Motor rotational direction

Directions *	Corresponding functions
Clockwise	• Pick up and feed a paper • Set the Change Lever on the Clutch mechanism
Counterclockwise	• Release the Change Lever from the Clutch mechanism

Note "*": The PF Motor pinion gear rotation direction = seen from the left side of the printer.

Following shows you the transmission path of the PF Motor drive to the LD Roller, the PF Roller and the EJ Roller. (The numbers in the following figure show you the order of transmission path.)
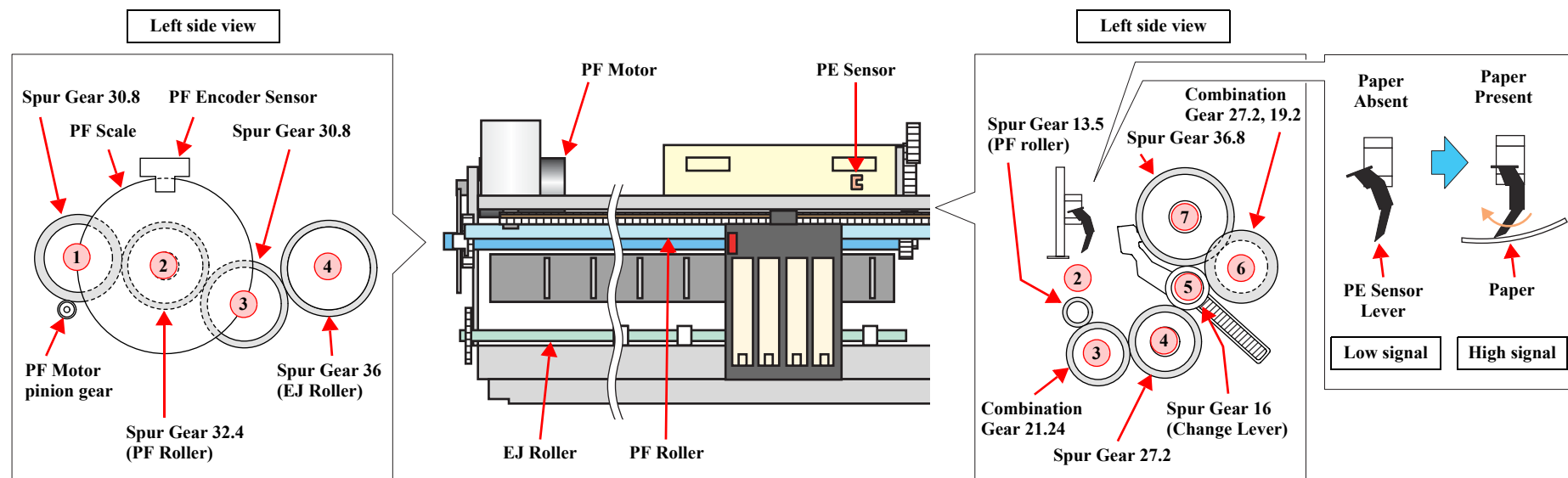
Note ： The Clutch gear is molded on the backside of the Spur Gear 36.8 such as Combination gear.

Figure 2-6. Paper loading/feeding mechanism

For your reference, the top or the end of a paper is usually detected with the PE Sensor. In case that the PE Sensor cannot detect the top of a paper in the paper loading sequence, the printer indicates the "Paper Out error". If the PE Sensor cannot detect the end of a paper in the paper feeding sequence, the printer indicates the "Paper Jam error". As for the details, refer to Chapter 3 **"TROUBLESHOOTING"** *(p.87)*.

2.2.4.1 Paper Loading Mechanism

The Paper loading mechanism consists of the Change Lever in the Pump Unit, the Holder Shaft Unit (including the Clutch mechanism) and the ASF Unit.
The Change Lever and the Clutch mechanism play a major role in the Paper loading mechanism as follows.

1. ASF home position detection function
    The ASF Unit on this printer does not have the ASF Home Position Sensor. Instead of the ASF Home Position Sensor, the Change Lever and the Clutch mechanism is used to detect the ASF home position.
    When the Change Lever is set on the Clutch mechanism with the counterclockwise rotation of the PF Motor pinion gear, the ASF home position is detected by this lever for the paper loading operation. In this time, the printer cannot load a paper from ASF Unit because the drive of the PF Motor is not transmitted to the LD Roller Shaft.

2. Paper loading function
    When the Change Lever is released from the Clutch mechanism with the clockwise rotation of the PF Motor pinion gear, the ASF home position detection function is changed over to the paper loading function. Therefore, the printer can load a paper from ASF Unit because the drive of the PF Motor is transmitted to LD Roller Shaft.

During paper loading, paper is transported from the ASF Unit into the printer by the rotation of the 2 cams of the LD Roller.

- ■ Cam (Large) : Hopper release
- ■ Cam (Small) : Paper Back Lever release

When 1 page paper is loaded, the cams mentioned above prepare the Hopper and Paper Back Lever for the next paper loading operation, and the remaining paper is returned to the standby position.

Figure 2-7 *(p.68)* and Figure 2-8 *(p.69)* show you the ASF paper loading sequence and the operation of each mechanism.

When the PF Motor pinion gear rotates CCW direction (right side view), the Change Lever pushes down the Clutch lever as right figure and the Clutch lock tooth is disengaged from the Clutch Gear. As the result, the LD Roller Shaft dose not rotate at all because the drive of the PF Motor is not transmitted. In this time, the Hopper is also pushed down by the two cams on the LD Roller Shaft, and the Paper Back Lever is set to avoid that papers are slipped down from the paper set position.

This position is the ASF home position.
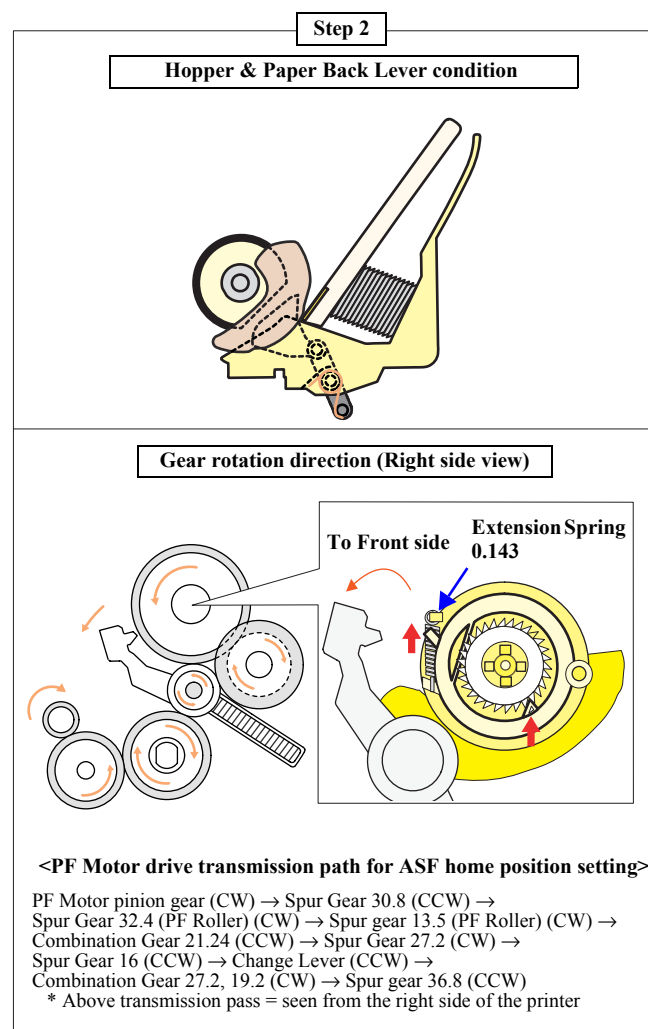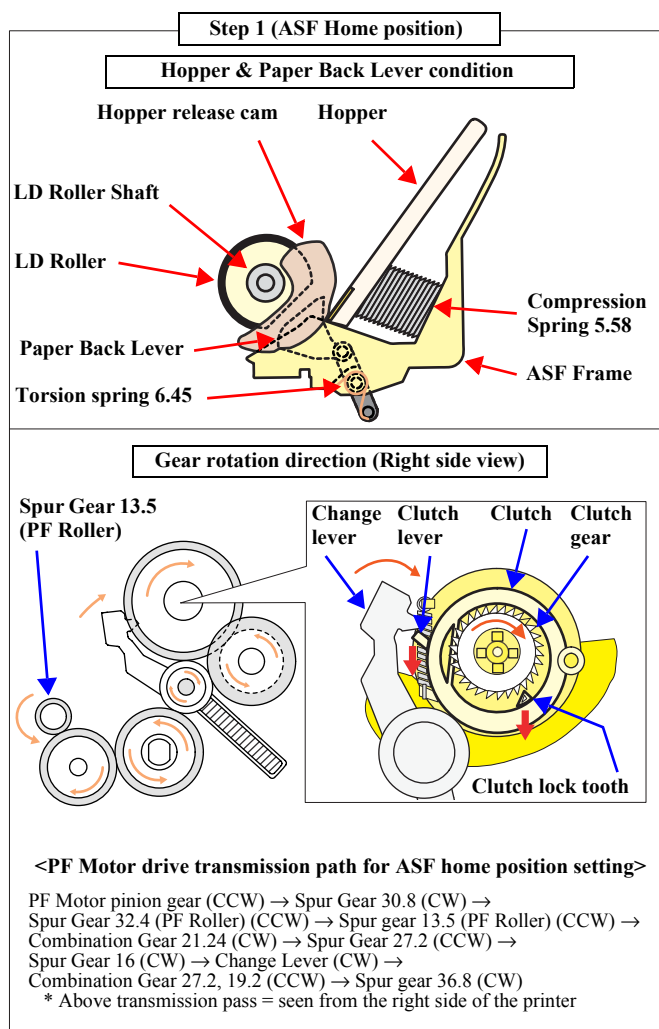
When a paper is loaded from the ASF Unit, the Change Lever moves to the front side of the printer with the CW rotation (right side view) of the PF Motor pinion gear and releases the Clutch lever. As the result, the Clutch turns back to the engagement position by the tension force of the Extension Spring 0.143. And, the Clutch gear is engaged with the Clutch lock tooth to transmit the drive of the PF Motor as left figure. In this time, the Change Lever is locked instantaneously by the protrusion on the backside of the Carriage Unit to change over from the ASF home position detection function to the paper loading function surely.

Step 1 (ASF Home position)

Hopper & Paper Back Lever condition

Hopper release cam   Hopper

LD Roller Shaft

LD Roller

Paper Back Lever

Torsion spring 6.45

Compression Spring 5.58

ASF Frame

Gear rotation direction (Right side view)

Spur Gear 13.5 (PF Roller)

Change lever   Clutch lever   Clutch   Clutch gear

Clutch lock tooth

<PF Motor drive transmission path for ASF home position setting>

PF Motor pinion gear (CCW) → Spur Gear 30.8 (CW) →
Spur Gear 32.4 (PF Roller) (CCW) → Spur gear 13.5 (PF Roller) (CCW) →
Combination Gear 21.24 (CW) → Spur Gear 27.2 (CCW) →
Spur Gear 16 (CW) → Change Lever (CW) →
Combination Gear 27.2, 19.2 (CCW) → Spur gear 36.8 (CW)
 * Above transmission pass = seen from the right side of the printer

Step 2

Hopper & Paper Back Lever condition

Gear rotation direction (Right side view)

To Front side   Extension Spring 0.143

<PF Motor drive transmission path for ASF home position setting>

PF Motor pinion gear (CW) → Spur Gear 30.8 (CCW) →
Spur Gear 32.4 (PF Roller) (CW) → Spur gear 13.5 (PF Roller) (CW) →
Combination Gear 21.24 (CCW) → Spur Gear 27.2 (CW) →
Spur Gear 16 (CCW) → Change Lever (CCW) →
Combination Gear 27.2, 19.2 (CW) → Spur gear 36.8 (CCW)
 * Above transmission pass = seen from the right side of the printer

Figure 2-7. ASF paper loading sequence (Step 1, 2)

The PF Motor pinion gear rotates CCW direction (right side view), and the drive of the PF Motor is transmitted to the LD Roller Shaft through the Clutch lock tooth and the Clutch gear. After the LD Roller pushes down the Paper Back Lever into the ASF Frame, the Hopper is released by the tension force of the Compression Spring 5.58. And, a paper is picked up with the frictional force between the LD Roller and the Pad Hopper.

Step 3

Hopper & Paper Back Lever condition

Hopper release cam

Compression Spring 5.58

Gear rotation direction (Right side view)

Hopper release cam

LD Roller Shaft

<PF Motor drive transmission path for ASF home position setting>

PF Motor pinion gear (CCW) → Spur Gear 30.8 (CW) →
Spur Gear 32.4 (PF Roller) (CCW) → Spur gear 13.5 (PF Roller) (CCW) →
Combination Gear 21.24 (CW) → Spur Gear 27.2 (CCW) →
Spur Gear 16 (CW) → Change Lever (CW) →
Combination Gear 27.2, 19.2 (CCW) → Spur gear 36.8 (CW)
 * Above transmission pass = seen from the right side of the printer

Step 4

Hopper & Paper Back Lever condition

ASF Frame

Paper Back Lever

Gear rotation direction (Right side view)

<PF Motor drive transmission path for ASF home position setting>

PF Motor pinion gear (CCW) → Spur Gear 30.8 (CW) →
Spur Gear 32.4 (PF Roller) (CCW) → Spur gear 13.5 (PF Roller) (CCW) →
Combination Gear 21.24 (CW) → Spur Gear 27.2 (CCW) →
Spur Gear 16 (CW) → Change Lever (CW) →
Combination Gear 27.2, 19.2 (CCW) → Spur gear 36.8 (CW)
 * Above transmission pass = seen from the right side of the printer

While the LD Roller rotates CCW direction (right side view) continuously, the top of a paper is loaded to the PF Roller. In this rotation, the Hopper returns to the open position and the Paper Back Lever is pushed up by the cam of the LD Roller. In this time, this lever returns papers to the stand-by position in ASF Unit for next paper loading operation.
Then, when the rolling LD Roller & the Clutch come at the above "Step1" position, the Clutch lever is locked with the Change Lever again. In this time, the drive of the PF Motor is interrupted and the drive is transmitted only to the PF Roller side for the paper feeding sequence.

Figure 2-8. ASF paper loading sequence (Step 3, 4)

2.2.4.2 Paper Feeding Mechanism

The Paper feeding mechanism consists of PF Motor, PF Roller, EJ Roller, PE Sensor, PF Encoder and PF Scale etc. The Paper feeding mechanism feeds a paper loaded from ASF Unit by using pairs of rollers.

1. One pair is the PF Roller and the Paper Guide Roller which is assembled in the Paper Guide Upper Unit. The drive of the PF Motor is transmitted to the Paper Guide Roller through the PF Roller.

2. Another pair is the EJ Roller and the Star Wheel which is assembled on the EJ Frame Unit. The drive of the PF Motor is transmitted to the Star Wheel through the EJ Roller.

Following figure shows you the transmission path for the PF Roller & the Paper Guide Roller and the EJ Roller & the Star Wheel.

The top of a paper is loaded to the PF Roller from the ASF Unit in the paper loading sequence. And then, when the PF Motor pinion gear rotates CW direction (left side view), a paper is fed by the PF Roller & the Paper Guide Roller and the EJ Roller & the Star Wheel in the printing operation & the paper feed sequence.
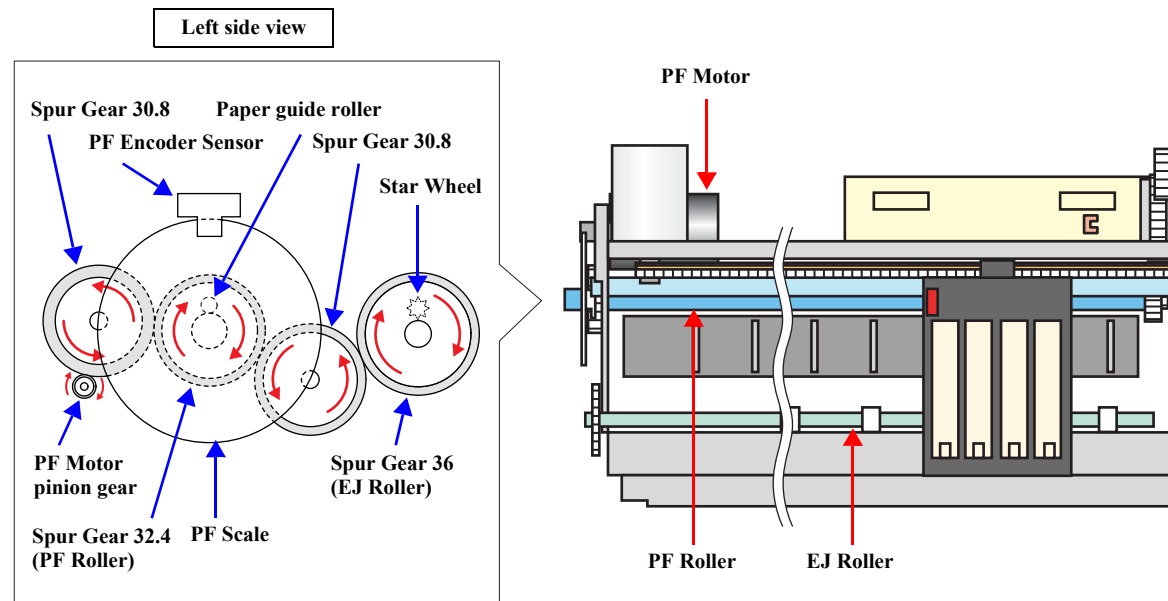
Transmission path (left side view)

• PF Motor pinion gear (CW) → Spur Gear 30.8 (CCW) → Spur gear 32.4 (PF Roller) (CW)

• PF Motor pinion gear (CW) → Spur Gear 30.8 (CCW) → Spur gear 32.4 (PF Roller) (CW) → Spur Gear 30.8 (CCW) → Spur Gear 36 (EJ Roller) (CW)

Figure 2-9. Paper feeding mechanism

2.2.5 Ink System Mechanism

The Ink System Mechanism consists of Pump mechanism with Carriage lock mechanism and Capping mechanism with Wiper mechanism. Following table lists the function for each mechanism.

Table 2-4. Function for each mechanism

Mechanism	Function
Capping mechanism *	This is to cover the surface of the Print Head with the cap in order to prevent the nozzle from increasing viscosity.
Wiper mechanism	This is to remove the foreign material and unnecessary ink on the nozzle plate of the Print Head.
Pump mechanism	This is to eject the ink from the Ink Cartridge, the ink cavity and the cap to the Waste Ink Pad.
Carriage lock mechanism	This is to lock the Carriage Unit with the Change Lever while the Carriage Unit is at the home position.

Note : Like the previous printers (Stylus Photo R300/R310), this printer adopts the valveless cap system. The air valve system used for the previous printer (Stylus COLOR 740) have two functions by the CR position in the capping condition as follows.

1) Valve closing condition (CL position)
   By closing the air valve, the ink is forcibly absorbed from the Ink Cartridge or the ink cavity by the Pump Unit and is ejected to the Waste Ink Pad while the Carriage Unit is in the CL position.

2) Valve opening condition (Ink absorption position)
   By opening the Air valve, the negative pressure is decreased and only the ink inside the Cap is ejected while the Carriage Unit is in the further right side than the CL position. (the ink is not absorbed from the Ink Cartridge or the ink cavity.)

The following shows you the Carriage Unit position for each condition easily.

Printing area	CR home position	CL position (valve closing condition)	Ink absorption position (valve opening condition)

But, on the valveless cap system, the above 2) operation is done outside the capping position. The Carriage Unit moves outside the CR home position and the pump absorbs the ink inside the Cap.

2.2.5.1 Capping Mechanism

The Capping mechanism covers the Print Head with the Cap to prevent the nozzle from increasing viscosity when the printer is in stand-by state or when the printer is off.

□ Wiper with the Cap unit

The wiping operation is controlled by the Carriage Unit movement. This operation is usually performed with every CL sequence which is to absorb the ink from the ink cartridge, the ink cavity by the Pump unit. Following figure shows you the mechanism for the wiping operation.

When the Carriage Unit is in the home position, the hook of the Slider Lock Lever is not latched to the dent of the Cap Frame.
In this time, the protrusion of the Cap Slider Lever does not reach the rightmost position of the Cap Frame.

Step 1

Protrusion

Not latched

Capping position (CR home position)

The Carriage Unit moves to the Wiper setting position on the rightmost position of the Cap Frame with keeping the Cap covered.
In this time, the hook of the Slider Lock Lever is latched to the dent of the Cap Frame.

Step 2

Latched

Wiper setting position

When the Carriage Unit moves to the left side from the Wiper setting position, the Cap Unit is pulled back by the tension force of the Extension Spring 0.788.
In this time, the Cap Unit is automatically set to the wiping position because the hook on the Slider Lock Lever is latched to dent of the Cap Frame. And, the wiping operation is performed according to the Carriage Unit movement.

Step 3

Protrusion of the Carriage Unit

Latched

Wiping position

When the wiping operation is finished and the Carriage unit moves further to the left side, the hook of the Carriage unit hits to the Slider lock lever.
In this time, the Slider lock lever is released and the Cap slider returns to the bottom position completely.
(The broken line is the position of the Carriage unit & the Slider lock lever just before being released.)

Step 4

Released

Released position (Bottom position)

Figure 2-10. Wiper mechanism

2.2.5.2 Pump Unit Mechanism

The PF Motor also controls the Pump Unit mechanism (including the Change Lever) as well as the Paper loading/feeding mechanism. The drive of the PF Motor is always transmitted to the Pump Unit. (And also, its drive is transmitted to the LD Roller through the Clutch mechanism & the Change Lever.)
On this printer, the Pump Unit mechanism including the Change Lever plays a major role expecting the ink eject operation. And, these operations control depending on the PF Motor rotational direction as the following table below.

Table 2-5. PF Motor rotational direction & Ink system mechanism

Directions *	Functions
Clockwise	• Pump release
Counterclockwise	• Absorbs the ink
	• Release the Change Lever from the Clutch mechanism

Note "*": The PF Motor rotational direction = seen from the left side of the printer.

1. Ink eject operation (usual operation)
   The ink is absorbed from the Ink Cartridge, the ink cavity and is ejected to the Waste Ink Pad from the Cap when the Ink Tube is pressed by a roller in the Pump Unit.

Following figure shows you the overview of the Pump Unit mechanism operation.
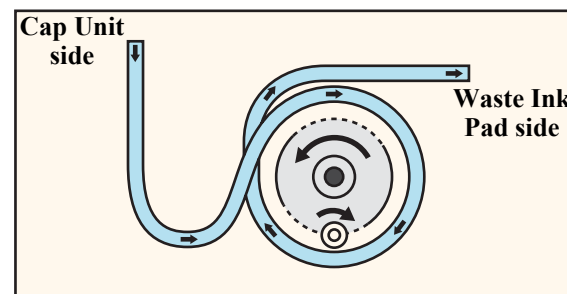
Note ： The PF Motor rotational direction = seen from the right side of the printer.

Figure 2-11. Pump mechanism

Transmission Path: PF Motor pinion gear (CW) → Spur Gear 30.8 (CCW) → Spur Gear 32.4 (PF Roller) (CW) → Spur gear 13.5 (PF Roller) (CW) → Combination Gear 21.24 (CCW) → Spur Gear 27.2 (Pump Unit gear) (CW)
(Above transmission pass = seen from the right side of the printer)
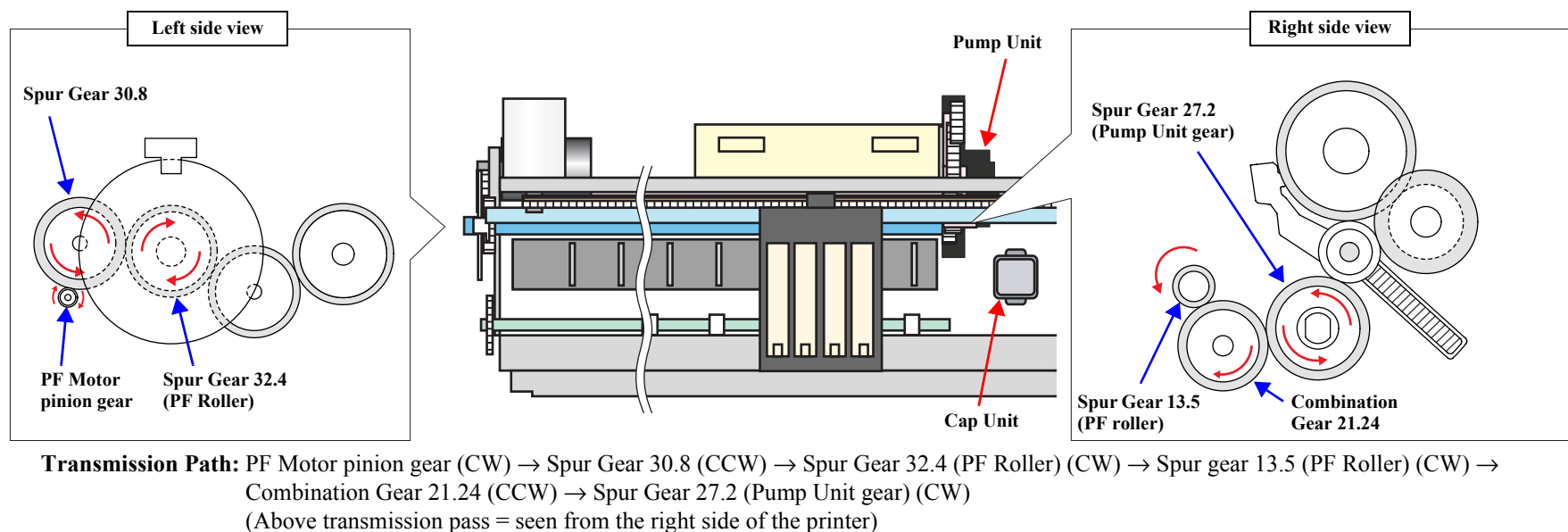
Figure 2-12.   PF Motor drive transmission path to the Pump Unit

2. Carriage lock operation by the Change Lever
    Unlike the previous printer (Stylus COLOR 680), this printer does not have the Carriage Lock Lever with the Wiper.
    Instead of the Carriage Lock Lever, the Change Lever is set to the front side of the printer while the Carriage Unit is in the CR home position.
    (As for the detailed mechanism for setting the Change Lever, refer to Step 2)

2.2.6 Ink Sequence

☐ Initial ink charge
    After the printer is purchased and the power is turned on for the first time, the printer must perform the Initial Ink Charge to charge the ink inside the ink cavity. When the Initial Ink Charge is completed properly, the printer releases the flag inside the EEPROM. Initial Ink Charge will take about 100 seconds for Stylus CX4700/CX4800/DX4800/DX4850/CX4100/CX4200/DX4200. If the power is turned off during the Initial Ink Charge, the CL3 will be performed at next power on timing.

☐ Manual Cleaning
    The Stylus CX4700/CX4800/DX4800/DX4850/CX4100/CX4200/DX4200 provides three types of manual cleaning to clean air bubbles, clogged ink with viscosity or foreign substances.
    The manual CL can be performed by the Control Panel Operation, the Printer Driver Utility and the Adjustment Program.

■ CL1
    • Ink absorption (Maximum)
      Black Ink: 0.181g, Color Ink: 0.543g
    • Wiping operation
      Wipes the nozzle plate by the rubber part on the Cap Unit.
    • Flashing operation
      Prevents color from mixing, and stabilizes ink surface inside the nozzle.

■ CL2
    • Ink absorption (Maximum)
      Black Ink: 0.445g, Color Ink: 1.335g
    • Wiping operation
      Wipes the nozzle plate by the rubber part on the Cap Unit.
    • Flashing operation
      Prevents color from mixing, and stabilizes ink surface inside the nozzle.

■ CL3
    • Ink absorption (Maximum)
      Black Ink: 1.015g, Color Ink: 3.045g
    • Wiping operation
      Wipes the nozzle plate by the rubber part on the Cap Unit.
    • Flashing operation
      Prevents color from mixing, and stabilizes ink surface inside the nozzle.

Independently of the printing path after the previous CL, perform manual CL from CL1 to CL3 in order if the cumulative printing timer counter is less than 9min. Only when the cumulative printing timer counter is more than 9min, execute only CL1.

Additionally, if the I/C is Ink Low or Out condition, any manual cleaning is prohibited and it is displayed on the LED indicators.

☐ Timer Cleaning
Like the previous printers, this printer dose not have Lithium battery which is used for the backup power source for Timer IC. So, this printer manages the printer off period or cleaning cycle by using the following method.
The Printer Driver sends the timer command to the printer before printing. The timer command is generated based on the PC's timer and it consists of year, month, date, hour, minute and second. As soon as the printer receives the timer command from the Printer Driver, the printer stores its command in address 06<H> and 07<H> in the EEPROM. Then, it is compared with the latest CL time which is stored in address 04<H> and 05<H> in the EEPROM. And, In case that the timer cleaning period is over the specific period, the printer performs the timer cleaning automatically. In this time, the printer stores the timer command in address 04<H>, 05<H>, 06<H>, 07<H> in the EEPROM.
Maximum 3.32g of the ink is consumed in the timer cleaning. (0.830g of black ink and 2.490g of color ink are consumed.)

☐ Flashing
Two different flushing operations are executed for the following reasons.

■ Pre-printing flushing
This is done before a start of printing to eliminate ink viscosity in the Print Head nozzles.

■ Periodic flushing
This is done during printing to prevent ink viscosity in the Print Head nozzles from increasing.

2.3 Scanner Mechanism

The Scanner Mechanism of Stylus CX4700/CX4800/DX4800/DX4850/CX4100/
CX4200/DX4200 is constructed of a Scanner Carriage Unit, Scanner Motor, Scanner
HP Sensor, etc., in the same way as previous A4 size scanners.

2.3.1 Scanner Carriage Mechanism

2.3.1.1 Scanner Carriage Unit Overview

The Scanner Carriage Unit is constructed of a CIS Board (including linear CCD), Rod
Lens Array, LED (light source), etc.

☐ CIS Board
    This takes the light information read from the document by the Rod Lens Array
    and converts it to digital information using the linear CCD.

☐ Rod Lens Array
    Many rod-shaped lenses are arranged in parallel, and the upright multiple images
    of each lens is overlapped to form a single continuous image. Compared to a
    regular lens, this has the special ability to reduce the distances between images.
    It can project at 1 to 1 size for imaging a linear CCD with a width identical to an
    A4 size document.

☐ LED
    The unit uses an LED for an exposure light source. Using an LED eliminates the
    need for an inverter board, and power consumption is reduced.
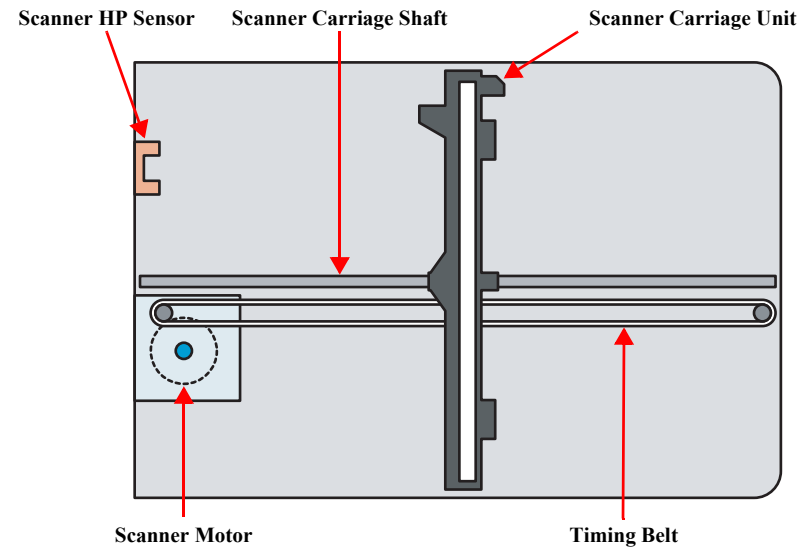
Figure 2-13. Scanner Mechanism
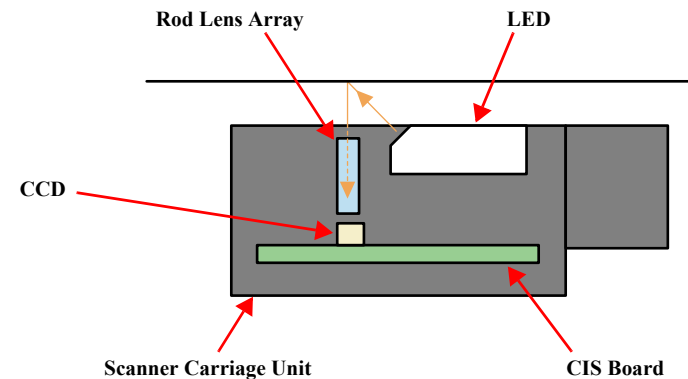
Figure 2-14. Scanning image

2.3.1.2 Scanner Carriage Unit Movement Overview

Scanning image is performed in the main scan direction (=1 line) by the CCD sensor and in the sub-scan direction (=several lines) combined with Scanner Carriage Unit movement. (refer to the figure below)
Line type, color CCD sensor can scan 1 line in main scan direction (parallel to the Scanner Carriage Unit) by one time. When scanning next lines after the second line in sub-scan direction, CR driving moves the Scanner Carriage Unit, which has CCD sensor inside, and scan the other lines. The scanned data is sent to the control board. The scanned data for "n" lines and "n-1" line are processed consecutively.
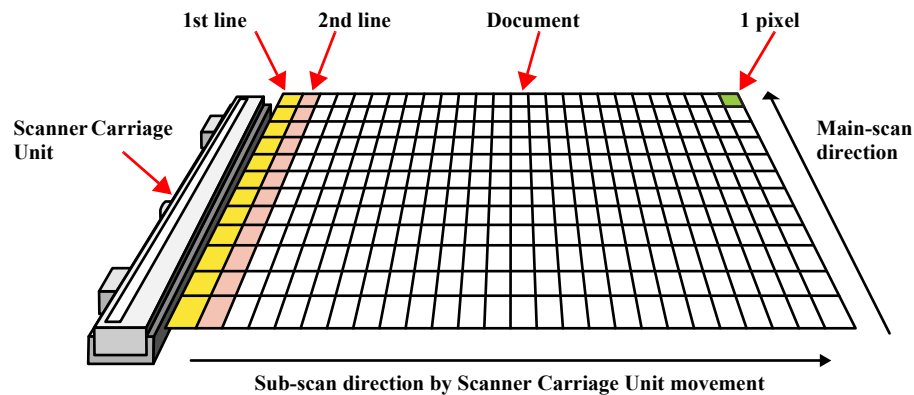
Figure 2-15. Scanner Carriage Unit movement

The table below shows the specifications for the stepping motor that controls the Scanner Carriage Mechanism.

Table 2-6. Scanner Motor specifications

Item	Description
Motor type	PM type stepping motor
Drive voltage	42V (DC)
Coil resistance	37Ω ± 10% (per phase at 25 degrees)
Inductance	TBDmH ± TBD% (1KH 1Vrms)
Driving method	PWM
Driver IC	A6627

Drive of the Scanner Motor is transferred to the Scanner Carriage Unit by the Scanner Timing Belt. The Scanner Carriage Unit slides in the secondary scanning direction. The Scanner Motor uses a stepping motor and drives using open loop control.

When the HP detection flag of the Scanner Carriage Unit disrupts the signal of the Scanner HP Sensor, the Scanner HP Sensor outputs a high signal, and the Scanner Carriage Unit is determined to be in the home position.
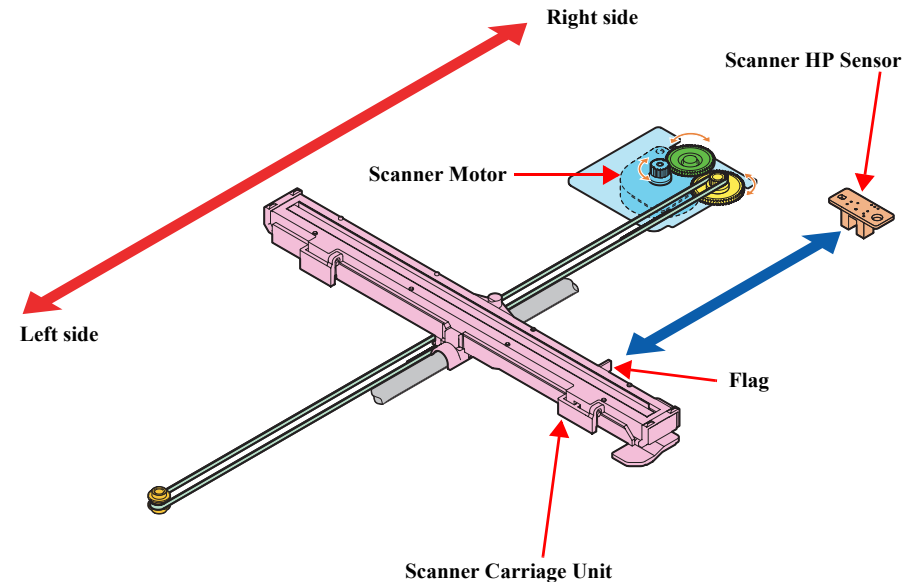
Figure 2-16. Scanner Carriage Unit Mechanism

2.4 Electrical Circuit Operating Principles

The electric circuit of the Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850 consists of the following boards.

☐ Main Board (CPU-ASIC 2 in 1 + Soldering Flash ROM)

■ C610 Main Board

☐ Power Supply Board

■ C610 PSB/PSE Board

NOTE: CPU and ASIC is integrated as one chip (IC8) on the Main Board.

This section provides operating principles of C610 Main Board and C610 PSB/PSE Board. Refer to Figure 2-17 *(p.78)* for the major connection of the each boards and their roles.
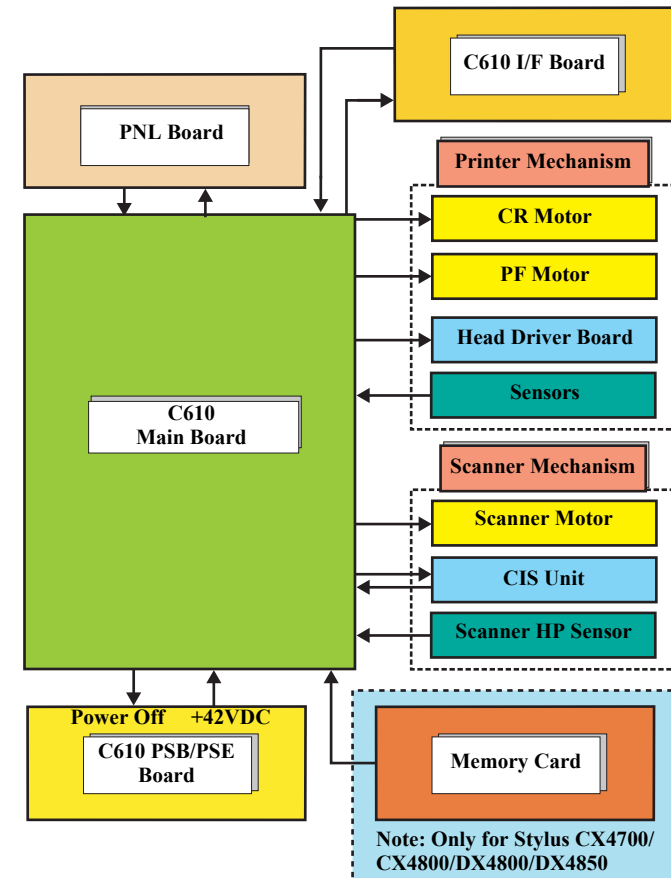
Figure 2-17.   Electric circuit

2.4.1 C610 PSB/PSE Board

In the PSB/PSE Board of Stylus CX4100/CX4200/CX4700/CX4800/DX4200/
DX4800/DX4850, the simulated oscillating stimulation flyback converter circuit
method is used, and it supplies +42VDC to the drive line. The application of the output
voltage is described below.

Table 2-7. Application Of The DC Voltages

Voltage	Application
+42VDC	• Motors (CR Motor, PF Motor, Scanner Motor) • Print Head common voltage • Print Head nozzle selector 42V drive voltage

AC voltage input from AC inlet first goes through filter circuit that removes high
frequency components and is then converted to DC voltage via the rectifier circuit and
the smoothing circuit. DC voltage is then lead to the switching circuit and FET Q1
preforms the switching operation. By the switching operation of the primary circuit,
+42VDC is generated and stabilized at the secondary circuit.

2.4.2 C610 Main Board

The logic circuit of the C610 Main Board is composed of the follows;

- Logic line (CPU-ASIC 2 in 1, SDRAM, P-ROM and so on)

- Motor control/drive circuit (CR Motor, PF Motor, Scanner Motor)

- Head control/drive circuit

- USB Interface control circuit

- Sensor circuit

- Combination circuit (RTC circuit, Reset circuit, EEPROM circuit)

The printer mechanism is controlled by the above circuits. Following explains the major characteristics of this Main Board.

☐ Lithium battery is not mounted

☐ Adoption of 3.3V/1.5V drive logic circuit components
The 5V formed by the Combination Motor Driver (IC5) of C610 Main Board is stepped down to 3.3V by the Regulator (IC6), and it is then used as drive voltage for many elements. In addition, when SPC shifts to low power mode, the 3.3V that was stepped down by the Regulator (IC6) is stepped down to 1.5V by the Combination Motor Driver (IC5) and elements that had been driven by 3.3V are driven by 1.5V for suppression of power consumption.

Table 2-8. 3.3V/1.5V & 5V Drive Components

5VDC	3.3 VDC	3.3/1.5VDC
• RTC (IC4)	• Flash ROM (IC1) • Card ASIC(IC9) • SDRAM (IC2)	• CPU-ASIC (IC8) • Motor driver (IC5) • Common driver (IC7)

2.4.2.1 Main Elements

Table 2-9 *(p.80)* shows the function of the each main elements on C610 Main Board.

Table 2-9. Main Elements

IC	Location	Function
Flash ROM	IC1	16Mbit • Firmware storage
SDRAM	IC2	Bus= 16 bit, 128Mbit DRAM
RTC	IC4	• EEPROM Default settings, backup for all parameters • Reset function • Timer function
CPU-ASIC	IC8	CPU mounted on the MAIN board is driven by clock frequency 48 MHz, 96MHz and controls the printer and scanner, SDRAM.
Motor Driver	IC5	• CR/PF/Scanner motor drive IC • Dropping 42V line to 5V • Dropping 3.3V line to 1.5V
Regulator	IC6	Dropping 5V line to 3.3V
Common Driver	IC7	Head drive control HIC • Generates head common voltage.
AD converter	IC11	Analog data from the scanner unit is converted into digital data.
Card ASIC*	IC9	Control the Memory Card slot.

Note "*": Only for Stylus CX4700/CX4800/DX4800/DX4850.
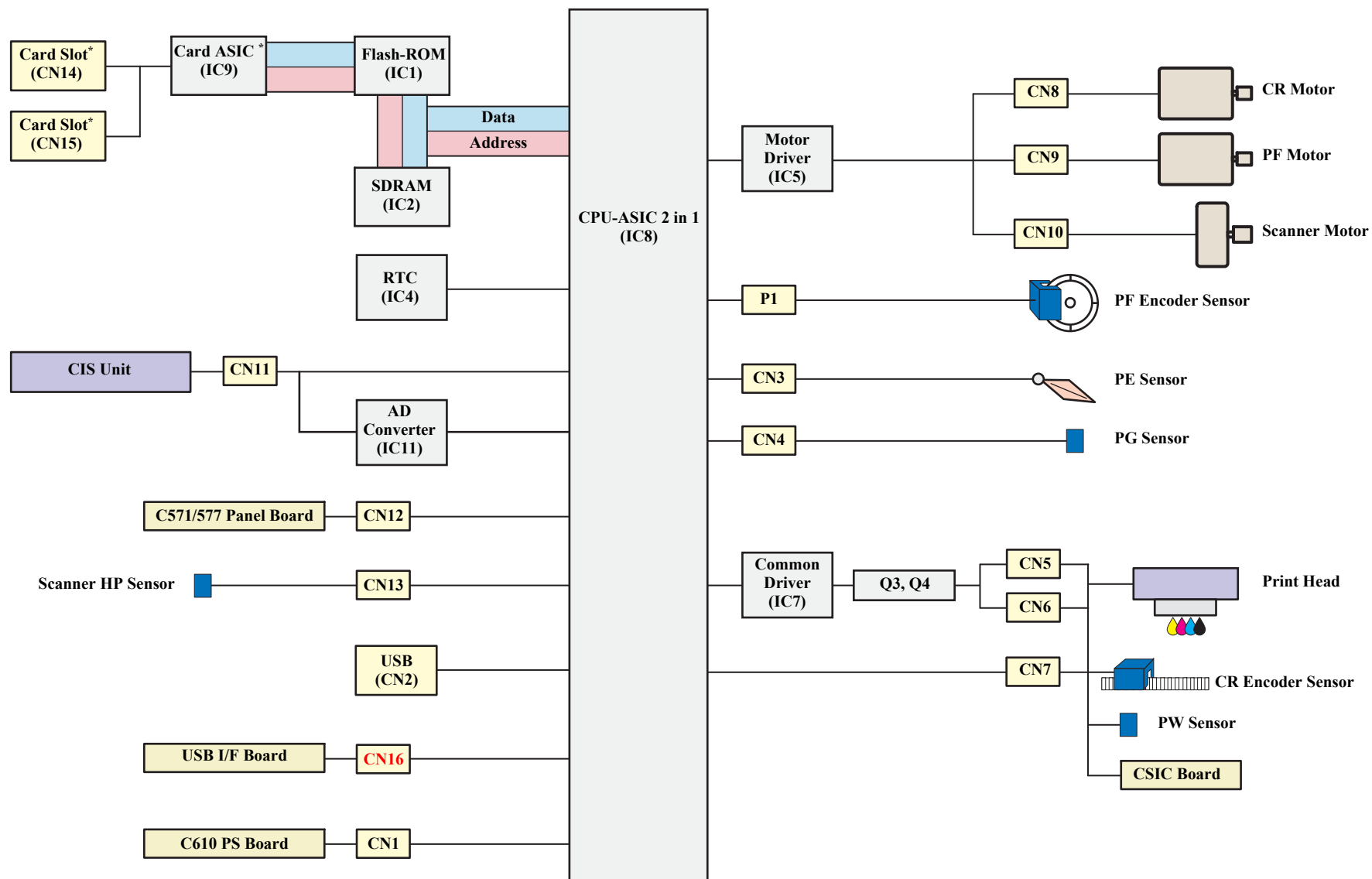
Note "*": Only for Stylus CX4700/CX4800/DX4800/DX4850.

Figure 2-18. Block Diagram For The C610 Main Board

2.4.2.2 Print Head Driver Circuit

The Print Head driver circuit consists of the following two components:

■ Head common driver circuit (Common driver IC7 & Wave amplifier transistor Q3, Q4)

■ Nozzle selector IC on the Print Head driver

The common driver (IC7) generates a basic drive waveform according to the output signals from CPU (IC8). The basic drive waveform is amplified by the transistors Q3 and Q4 (the amplified one is called drive waveform.) and then transferred to the nozzle selector IC on the Print Head driver board. Print data is converted to serial data by the CPU and then sent to the nozzle selector IC on the Print Head driver board. Based on the serial data, the nozzle selector IC determines the nozzles to be actuated. The selected nozzles are driven by the drive waveforms amplified by the transistor Q3 and Q4. Refer to Figure 2-19 *(p.82)* for the Print Head driver circuit block diagram.

□ Head common driver circuit
   The basic drive waveform is generated in the common driver (IC7) based on the following 13 signal lines output from the CPU (IC8); DATA0-DATA9, LAT, RESET, and PSCNT.
   By the DATA signal output from the CPU, the original data for the basic drive waveform is written in the memory in the common driver (IC7). The addresses for the written data are determined by DATA0-DATA9 signals. Then, the necessary data is selected from the address and appropriate basic drive waveform is generated. Generated basic drive waveform is transferred to nozzle selector IC on the Print Head driver board through the transistor Q3 and Q4 and applied to the nozzle PZT specified by nozzle selector IC.

□ Nozzle selector circuit
   Printing data is allocated to the four rows (the number of the head nozzle rows) and converted into serial data by the CPU (IC8). Then the converted data is transferred to the nozzle selector IC through the four signals lines (HS01 to HS04). Data transmission from the CPU to the nozzle selector synchronizes with the LAT signal and SCK clock signal. Based on the transmitted data, appropriate nozzle is selected and the PZTs of the selected nozzle are driven by the drive waveform output from the head common driver.
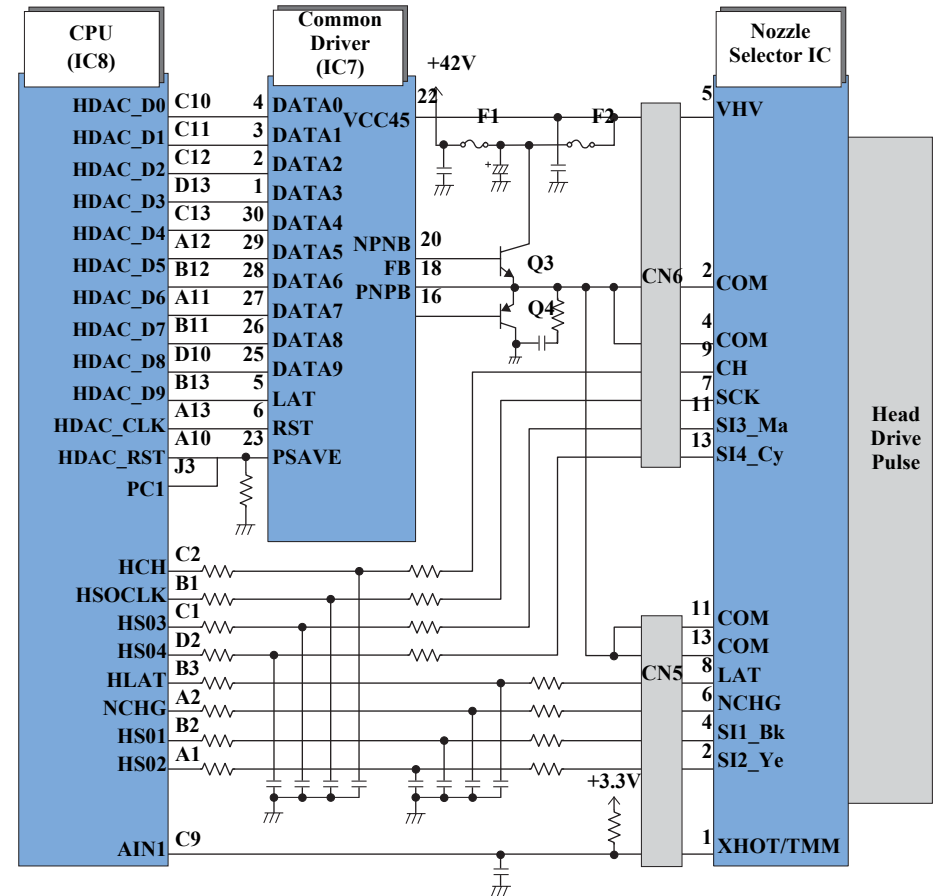
Figure 2-19. Print Head Driver Circuit

2.4.2.3 Motor Driver Circuit

CR/PF Motor drive circuit

The motor driver IC (IC5) on the Main board drives CR/PF Motor. This product uses DC motor and performs constant current PWM drive.

Based on the output pulse (signal) from CR Encoder or PF Encoder, the CPU (IC8) sets the appropriate drive current value for each operational action and outputs the value as a special control signal to the Motor Driver (IC5). Then, based on the signal output from the CPU, the Motor Driver outputs the motor drive current to the CR/PF Motor. When no data has been received for 5 minutes, the CPU sets the Motor Driver current value to 0, turning off the Motor Driver, in order to conserve electricity.

Scanner Motor Driver Circuit

The motor driver IC (IC5) on the Main board drives Scanner Motor. This product uses PM type stepping motor and performs constant current bi-polar drive.

The Motor Driver IC (IC9) forms the motor drive waveform based on the signal output from the CPU (IC8), controlling the Scanner Motor.

When no data has been received for 5 minutes, the CPU sets the Motor Driver current value to 0, turning off the Motor Driver, in order to conserve electricity.
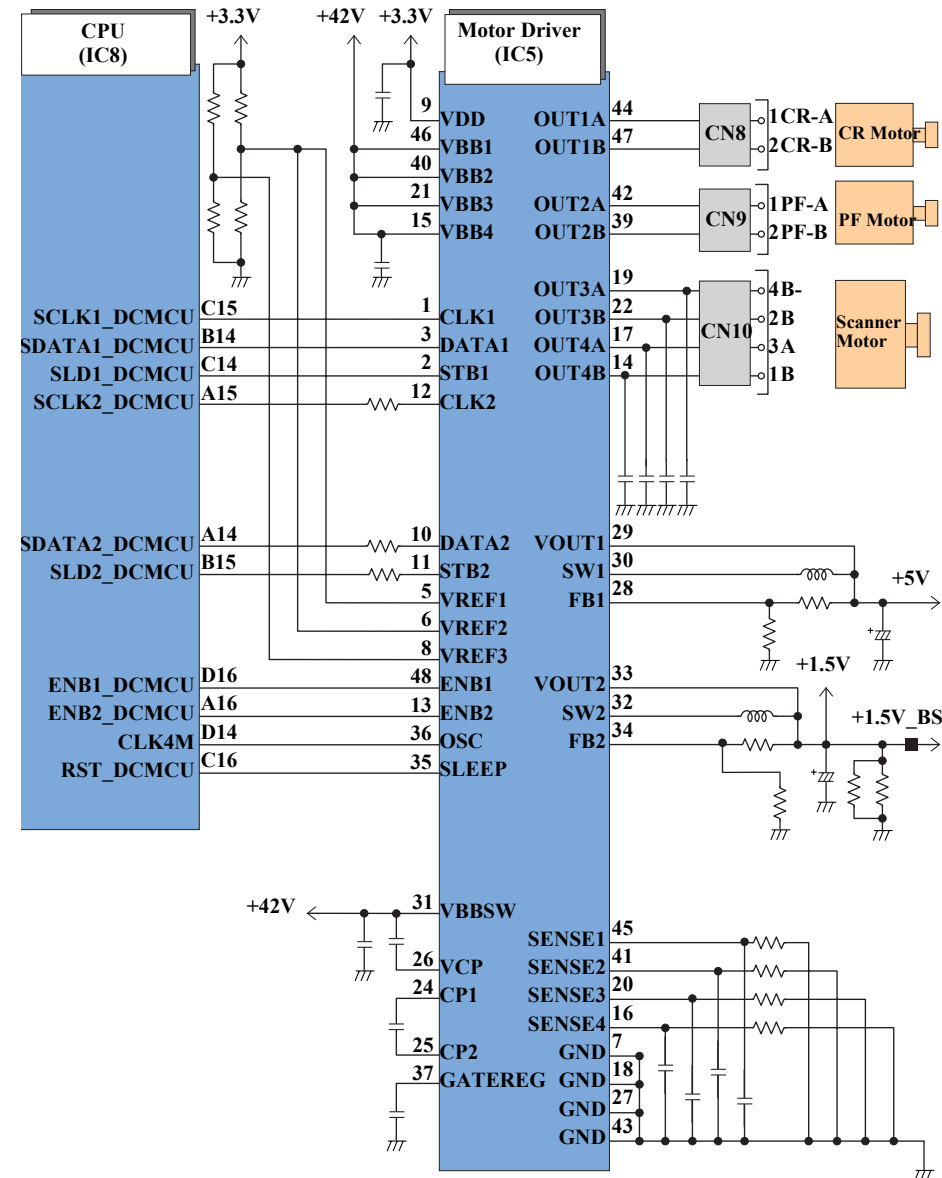
Figure 2-20. Motor Driver Circuit Block Diagram

2.4.2.4 Combination Circuit

This printer differs from previous models by using a combination IC that integrates the reset circuit, EEPROM and RTC.

Reset Circuit

RTC IC (IC4) on the Main Board monitors the three voltage: +3.3V for the logic line, +5V for the logic line and +42V for the drive line. Reset Circuit outputs the reset signal to CPU (IC8) in the following case.

☐ +3.3V line reset circuit
The 3.3V line is monitored at the VDD port of IC4, and if an abnormal voltage is detected, a reset signal for the CPU is output from the FRST port ofIC4.

☐ +5V line reset circuit
The 5V line is monitored at the VDD2 port of IC4, and if an abnormal voltage is detected, a reset signal for the CPU is output from the RST port of IIC4.

☐ +42V line reset circuit
The 42V line is monitored at the VEX port of IC4, and if an abnormal voltage is detected, a reset signal for the CPU is output from the EXO port of IC4.

EEPROM Control Circuit

When the printer power is turned off, the following information is stored in EEPROM (IC4) which is nonvolatile memory. And, when the printer power is on, CPU (IC8) reads the information from EEPROM.

Information stored in EEPROM is listed below.

■ Various ink counter (I/C consumption counter, Waste Ink Pad counter, etc.)

■ Mechanical setting value (Head ID, Bi-D Adjustment, USB ID, etc.)

EEPROM is connected to CPU with 4 lines and each line has the following function.

■ CE: Chip selection signal

■ CLK: Data synchronism clock pulse

■ DI: Data writing line (serial data) at power off.

■ DO: Data reading line (serial data) at power on.

RTC Circuit

By adoption of the large-capacity capacitor (C9) for timer, the Power-off timer can be backed up for about one week after power-off.
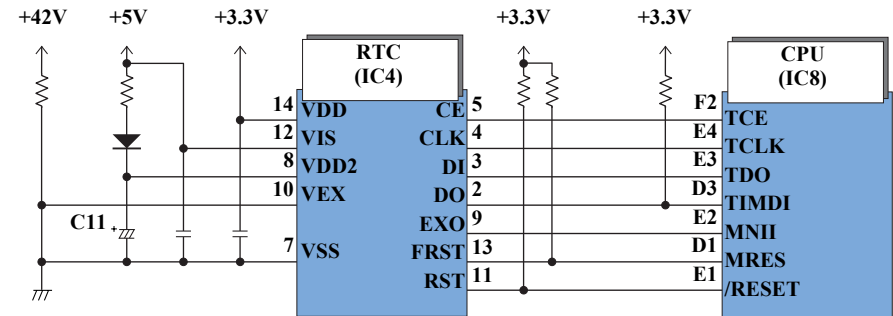
Figure 2-21. RTC Circuit Block Diagram

2.4.2.5 Sensor Circuit

CPU (IC8) on the Main Board monitors the status of the printer by several sensors. However, unlike the previous product, ASF Unit on this printer does not have ASF Sensor. Instead of ASF Sensor, Change Lever and the Clutch mechanism is used to detect ASF home position. (As for the ASF home position detection, refer to .)

☐ **PE Sensor**
This sensor is mounted at the right side center of the Printer Mechanism, and it detects the presence/absence of paper when the paper passes through the Paper Guide Rear. The PE Sensor is constructed of a transmissive photosensor and the PE Sensor Lever.

■ Paper Absent: Because the PE Sensor Lever does not interfere between the photosensor terminals, a low signal is output to the CPU.

■ Paper Present: The PE Sensor Lever interferes between the photosensor terminals, and a high signal is output to the CPU.

☐ **PG Sensor**
This sensor is mounted at the left end lower section of the Printer Mechanism, and it detects the condition of PG (Platen Gap). The detection method used by the PG Sensor is mechanical contact points.

■ PG Normal: A low signal is output to the CPU.

■ PG Large: A high signal is output to the CPU.

☐ **PW Sensor**
The sensor is mounted to the bottom of the Carriage Unit. It detects the top and bottom, left and right edges of the paper being fed.

■ Paper absent: A low signal is output to the CPU.

■ Paper present: A high signal output to the CPU.

☐ **CR Encoder Sensor**
The sensor is composed of a transmissive photosensor mounted to the back of the carriage and a linear scale mounted in the CR scan direction. Minimum resolution of 1/180 inch is provided, and output to the CPU is a high signal for the black slits on the linear scale and a low signal for transparent slits. Control of the CR Motor is based on the output signal. The home position of the Carriage Unit is detected by this sensor.

☐ **PF Encoder Sensor**
The sensor is composed of a transmissive photo sensors mounted to the loop scale of the PF Roller Unit left side and to the Main Board. Minimum resolution of 1/180 inch is provided, and output to the CPU is a high signal for the black slits on the loop scale and a low signal for the transparent slits on the loop scale. Control of the PF Motor is based on the output signal.

☐ **Thermistor (THM)**
The thermistor is directly mounted on the Print Head driver board. It monitors the temperature around the Print Head and determines the proper head drive voltage to uniform the weight of the ink fired from the Print Head. This information is fed back to the CPU analog port. When the temperature rises, the head drive circuit lowers the drive voltage: When the temperature lowers, the head drive circuit rises the drive voltage.

☐ **Scanner HP Sensor**
Mounted in the Scanner Unit, this sensor detects whether the CIS Unit is inside or outside the home position

■ Inside HP: A high signal output to the CPU.

■ Outside HP: A low signal is output to the CPU.

The block diagram for the sensor circuit is shown below.
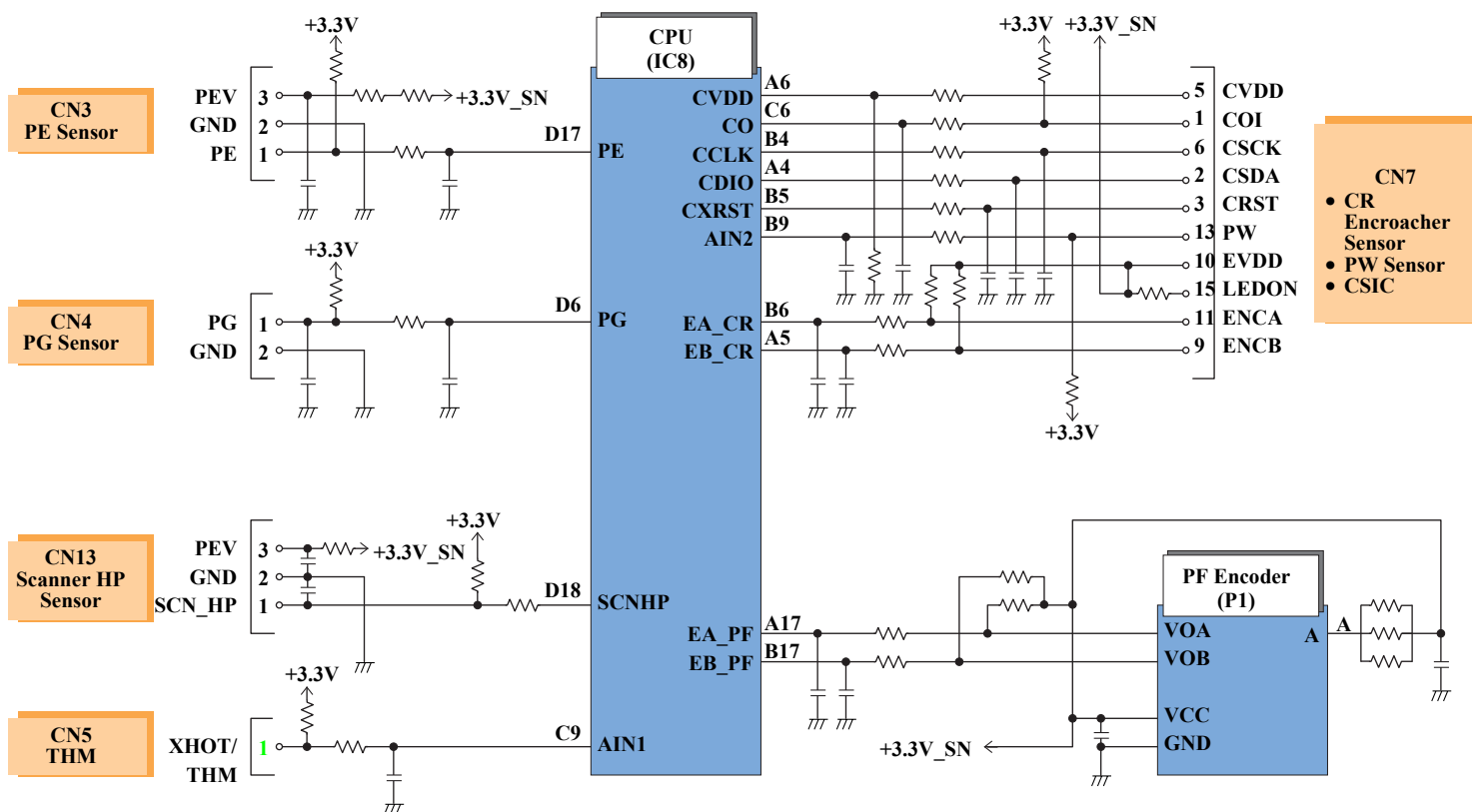
Figure 2-22. Sensor Circuit Diagram

TROUBLESHOOTING

3.1 Overview

This chapter describes unit-level troubleshooting. Refer to the flowchart in this chapter to identify the defective unit and perform component level repair if necessary. This chapter also explains motor coil resistance, sensor specification and error indication.

```
          ┌─────────────────────────────┐
          │           START             │
          └─────────────────────────────┘
                         │
                         ▼
          ┌─────────────────────────────┐
          │  Unit-level troubleshooting │
          └─────────────────────────────┘
                         │
                         ▼
          ┌─────────────────────────────┐
          │        Unit repair          │
          └─────────────────────────────┘
                         │
                         ▼
          ┌─────────────────────────────┐
          │   Assemble & Adjustment     │
          └─────────────────────────────┘
                         │
                         ▼
          ┌─────────────────────────────┐
          │            END              │
          └─────────────────────────────┘
```
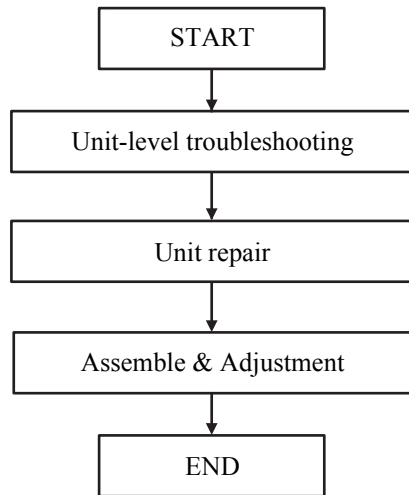
Figure 3-1. Troubleshooting flowchart

Table 3-1. Motor, coil resistance

Motor	Location	Check point	Resistance
Scanner motor	CN10	Pin 1 and 3 Pin 2 and 4	$37\Omega \pm 10\%$

Note : Since CR Motor and PF Motor are DC motors, the resistance among the electric poles varies. Therefore, judge if it is normal or abnormal based on if there is operation of the motor or not; the resistance values cannot be used to judge the abnormality. However, it is difficult to judge accurately, if it is not clear, replace the motor.

Table 3-2. Sensor check point

Sensor name	Check point	Signal level	Switch mode
PE Sensor	CN3 / Pin 1 and 2	Less than 0.4V	Off: No paper
		More than 2.4V	On : Detect the paper
PG Sensor	CN4 / Pin 1 and 2	—	On : PG large Off: PG normal
Scanner HP Sensor	CN13 / Pin 1 and 2	—	On : Within Scanner Carriage home position Off: Out of Scanner Carriage home position
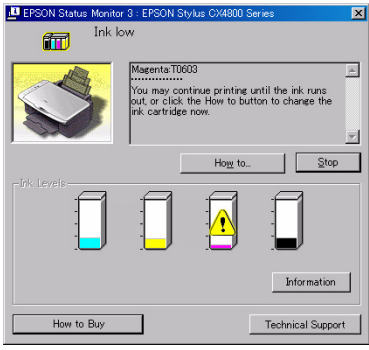
3.2 Error Indications and Fault Occurrence Causes

This section describes the LED indications, STM3 messages and fault occurrence causes at occurrence of the following errors during any sequence/operation (e.g. power-on sequence, paper feeding/loading sequence, ink sucking sequence).

NOTE: The STM3 windows shown in the table in the following pages are the ones of Stylus CX4800, however, other models show almost the same diplays as those except the following items:
1) SPC name (SPC: Scanner/Printer/Copier)
2) T-code for each ink cartridge (refer to Table 1-13 (p.20))

Table 3-3. Error Indications and Fault Occurrence Causes

Printer Status			Ink low	PG open	Index sheet error 3 (Incorrect card)	Index Sheet error 2 (Incorrect marking)
Indications	Power		—	—	—	—
	Error		—	Blink*1	Blink*1	Blink*1
	Ink		Blink	—	—	—
	Memory Card (only for Stylus CX4700/CX4800/ DX4800/DX4850)	1	—	—	—	—
		2	—	—	Blink*1	Blink*1
		3	—	—	—	—
	7-seg.		—	"H" blink*1	"4" blink*1	"3" blink*1
	Paper Type	1	—	—	—	—
		2	—	—	—	—
	Paper Size	1	—	—	—	—
		2	—	—	—	—
	Fit to Page		—	—	—	—
	Card Access		—	—	—	—
Status monitor 3 message				—	—	—
Fault Occurrence Cause			Some ink is near end.	Platen gap is at open position while standalone function.	The different card or updated card is found for that sheet.	No marking on the index sheet.

Note *1: Blinks twice continuously.

Table 3-4. Error Indications and Fault Occurrence Causes

Printer Status			Index sheet error 1 (No index sheet)	Memory card error (Incompatible memory card)	DSC direct error
Indications	**Power**		—	—	—
	Error		Blink*1	Blink*1	Blink
	Ink		—	—	Off
	Memory Card (only for Stylus CX4700/CX4800/ DX4800/DX4850)	**1**	—	Blink*1	—
		2	Blink*1	Blink*1	—
		3	—	Blink*1	—
	7-seg.		"2" blink*1	"1" blink*1	"P" blink 2
	Paper Type	**1**	—	—	—
		2	—	—	—
	Paper Size	**1**	—	—	—
		2	—	—	—
	Fit to Page		—	—	—
	Card Access		—	—	—
Status monitor 3 message			—	—	—
Fault Occurrence Cause			No index sheet is recognized correctly.	This memory card is not available with this unit. Or, no image can be found on that card when memory card print is started.	An unsupported device is connected to the port for the connection of external memory devices.

Note *1:   Blinks twice continuously.

Table 3-5. Error Indications and Fault Occurrence Causes

Printer Status			Double feed	Paper out	Paper jam
Indications	**Power**		—	—	—
	Error		On	On	Blink
	Ink		Off	Off	Off
	Memory Card (only for Stylus CX4700/CX4800/ DX4800/DX4850)	1	—	—	—
		2	—	—	—
		3	—	—	—
	7-seg.		—	—	—
	Paper Type	1	—	—	—
		2	—	—	—
	Paper Size	1	—	—	—
		2	—	—	—
	Fit to Page		—	—	—
	Card Access		—	—	—
Status monitor 3 message					
Fault Occurrence Cause			Double-feeding occurred during duplex printing.	Failure to load paper to print.	Paper stays in the paper path after paper ejection.

Note *1:   Blinks twice continuously.

Table 3-6. Error Indications and Fault Occurrence Causes

Printer Status			Ink out, No ink cartridge, or Incorrect ink cartridge	Maintenance request	Fatal error
Indications	Power		—	Blink	Blink
	Error		Off	On	Blink
	Ink		On	On	Blink
	Memory Card (only for Stylus CX4700/CX4800/ DX4800/DX4850)	1	—	Blink	Blink
		2	—	Blink	Blink
		3	—	Blink	Blink
	7-seg.		—	"E" blink	"E" blink
	Paper Type	1	—	Blink	Blink
		2	—	Blink	Blink
	Paper Size	1	—	Blink	Blink
		2	—	Blink	Blink
	Fit to Page		—	Blink	Blink
	Card Access		—	—	—
Status monitor 3 message					
Fault Occurrence Cause			• Some ink cartridge is running out of ink. • Ink cartridge is not set. • Incorrect ink cartridge is set.	Part(s) inside the printer has come to its end of life.	Mechanical or internal trouble has occurred.

Note *1:   Blinks twice continuously.

3.3 Troubleshooting

You can identify the troubles by using the checklist in this section after confirming the LED indication on the SPC. If you connect the SPC to your PC and see an error message on the STM3, you can short the total repair time. And, when you find out the defective parts, replace them by referring the Chapter 4 **" TROUBLESHOOTING" *(p.87)***.
The following tables describe the error check points.

Table 3-7. Check point for the communication error according to each phenomenon
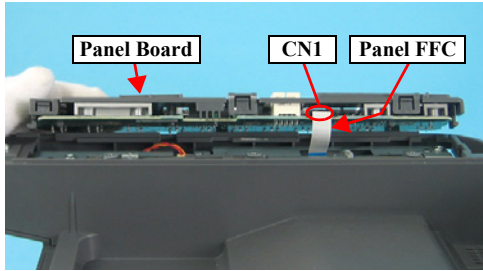
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the SPC does not operate at all.	Panel Unit	1. Check if the Panel FFC is connected to the CN1 on the Panel Board. 	1. Connect the Panel FFC to CN1 on the Panel Board.
			2. Check if the Panel FFC is not damaged.	2. Replace the Panel FFC with new one.
			3. Check if the Panel Board is not damaged.	3. Replace the Panel Board with new one.

Table 3-7. Check point for the communication error according to each phenomenon
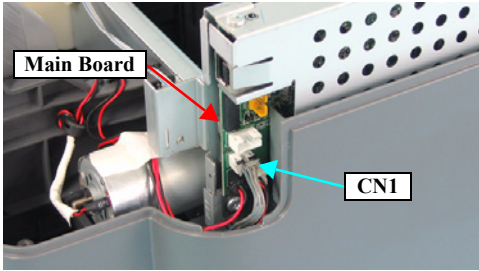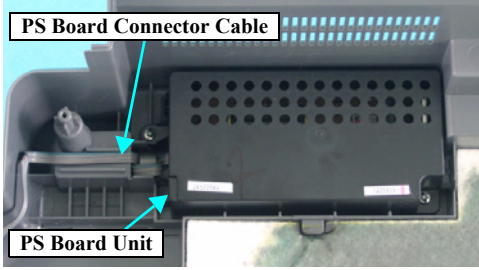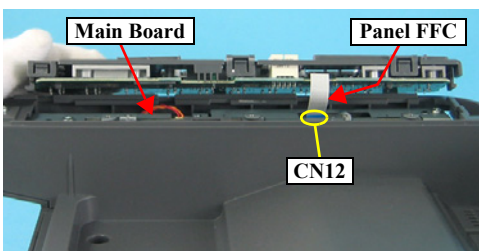
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the SPC does not operate at all.	PS Board Unit	1. Check if the PS Board Connector Cable is connected to the CN1 on the Main Board. 	1. Connect the PS Board Connector Cable to CN1 on the Main Board.
			2. Check if the PS Board Connector Cable/PS Board is not damaged. 	2. Replace the PS Board Unit with new one. * If the problem is not solved, replace the Main Board with new one.
• Operation • –	When turning on the power, the power on sequence is performed correctly. But, when any printer job is sent to the SPC, a communication error is indicated with STM3.	USB Cable	1. Check if the USB Cable is connected between the SPC and the PC.	1. Connect the USB Cable to the SPC and the PC.
		Main Board Unit	1. Check if an incorrect model name is not stored into the address of the EEPROM on the Main Board.	1. Use the Adjustment Program to write the correct value to the EEPROM address.
			2. Check if the Panel FFC is connected to the CN12 on the Main Board. 	2. Connect the Panel FFC to the CN12 on the Main Board.

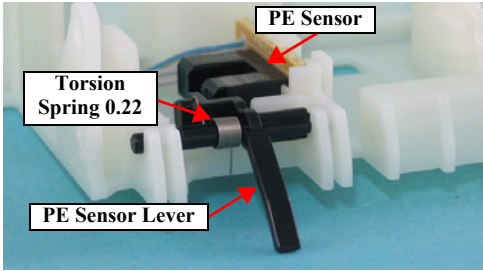**Table 3-8. Check point for the error before the initial ink charge according to each phenomenon**

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Inside HP	The SPC does not perform the initial ink charge and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the Ink Cartridge can be used by installing it to other SPC.	1. Replace the Ink Cartridge with a brand-new one.
		Main Board	1. Check if an incorrect data is not stored into the address of the EEPROM on the Main Board.	1. Set the proper destination by using Adjustment Program.
• Power on • Anywhere	The SPC does not perform the ink replacement CL and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the Ink Cartridge can be used by installing it to other SPC.	1. Replace the Ink Cartridge with a brand-new one.
	The SPC does not perform the printing operation and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the ink is remaining in the Ink Cartridge.	1. Replace the Ink Cartridge with a brand-new one.
			2. Check if the Ink Cartridge can be used by installing it to other SPC.	2. Replace the Ink Cartridge with a brand-new one.

Table 3-9. Check point for the PG error according to each phenomenon
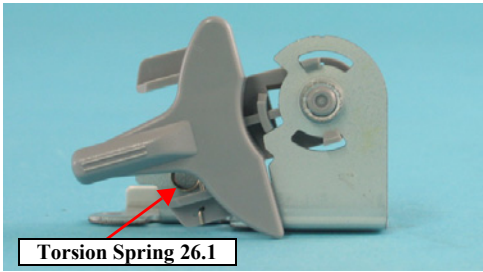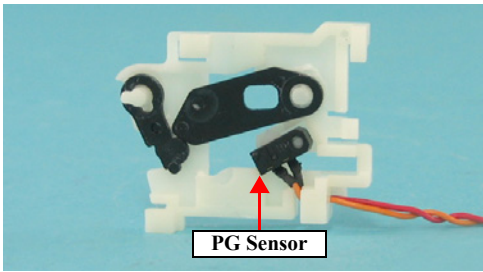
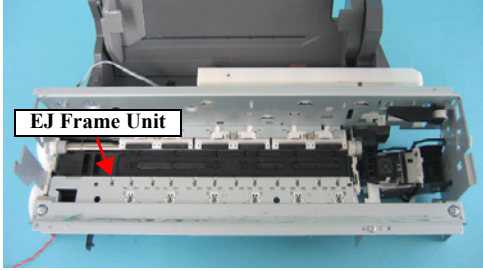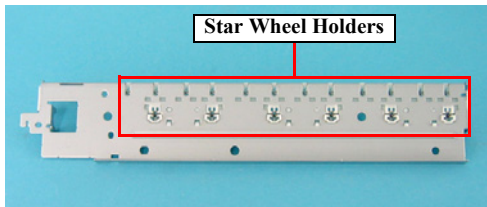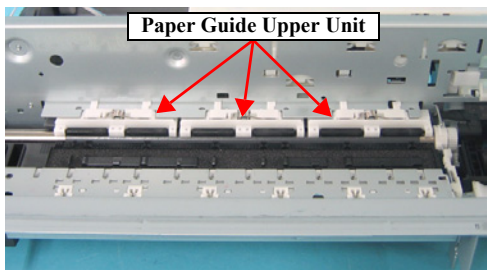| Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • _	This error is generated when using stand-alone copy.	Torsion Spring 19.01	1. Check if the Torsion Spring 26.1 is properly installed. **Torsion Spring 26.1**	1. Properly install the Torsion Spring 26.1. * Only when the Torsion Spring 26.1 comes off while the PG lever is set to "H" position.
		PG Sensor	1. Check if the PG Sensor is not damaged. **PG Sensor**	1. Replace the PG Sensor with a new one.
		Main Board	1. Check if the Main Board is not damaged.	1. Replace the Main Board with a new one.

Table 3-10. Check point for the Index Sheet. error (incorrect card) according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • _	This error is generated when attempting to print from Index Sheet.	Index Sheet	1. Check if the Index Sheet was printed from an inserted Memory Card.	1. Switch to Index Sheet printed from an inserted Memory Card.
		Memory Card	1. Check if the Memory Card storing the Index Sheet data is inserted.	1. Insert Memory Card storing the Index Sheet data.
			2. Check if the Memory Card is not damaged.	2. Replace the Memory Card with a new one.

Table 3-11. Check point for the Index Sheet. error (incorrect marking) according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	This error is generated when attempting to print from Index Sheet.	Index Sheet	1. Check if mark of Index Sheet has been properly covered over.	1. Properly cover over mark.

Table 3-12. Check point for the Index Sheet. error (No index Sheet.) according to each phenomenon
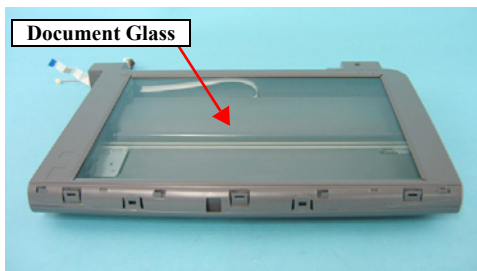
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	This error is generated when attempting to print from Index Sheet.	Index Sheet.	1. Check if the Index Sheet. is set in the wrong way.	1. Set the Index Sheet. correctly.
			2. Check if the Index Sheet. standard position is not clean.	2. Reprint the Index Sheet.
		Document Cover	1. Check if the Document Cover is not open.	1. Close the Document Cover.
		Scanner Housing Upper	1. Check if the Document Glass is not clean. **Document Glass** 	1. Clean the Document Glass.

Table 3-13. Check point for the Memory Card error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The Memory Card is unrecognized and an error is displayed.	Memory Card	1. Check if the Memory Card is acceptable.	1. Replace the Memory Card with an acceptable one.
			2. Check if the Memory Card is not damaged.	2. Replace the Memory Card with a new one.
		Main Board Unit	1. Check if the Memory Card slot pins on the Main Board is not bent.	1. Change the Main Board Unit with a new one.

Table 3-14. Check point for the Double feed error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	After both surfaces were printed, the paper was ejected but an error is displayed.	ASF Unit	1. Check if the Extension Spring Retard operates correctly in the paper loading sequence. Extension Spring Retard	1. Set the Extension Spring Retard between the Retard Roller Unit and the ASF Frame.
			2. Check if the Paper Back Lever operates correctly in the paper loading sequence. Torsion Spring 6.45 Paper Back Lever	2. Set the Torsion Spring 6.45 between the ASF Frame and the Paper Back Lever.

Table 3-15. Check point for the paper out error according to each phenomenon
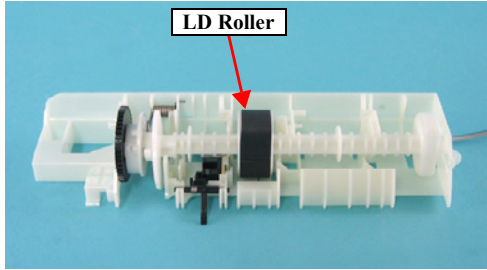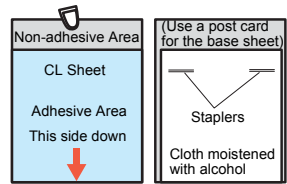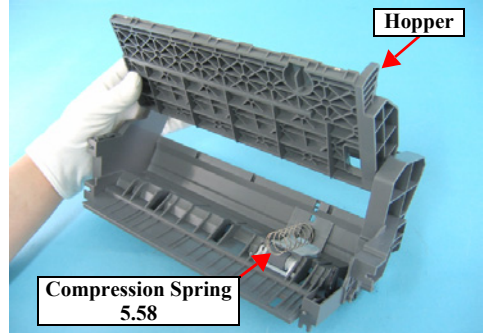
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • _	The LD Roller cannot pick up paper although the LD Roller attempt to rotate correctly.	Holder Shaft Unit	1. Check if any paper dust is not adhered to the surface of the LD Roller. 	1. Set a cleaning sheet in the ASF Unit up side down. Then holding the top edge, try to load the paper from the Printer driver. The micro pearl on the LD Roller surface is removed. To remove severe smear, staple a cloth moistened with alcohol to a post card and clean the roller in the same manner.
• Operation • _	The Hopper does not operate during the paper loading sequence although the LD Roller rotates to load paper from the ASF Unit.	ASF Unit	1. Check if the Hopper operates correctly in the paper loading sequence. 	1. Reassemble the Compression Spring 5.58 between the ASF Frame and the Hopper.

Table 3-15. Check point for the paper out error according to each phenomenon
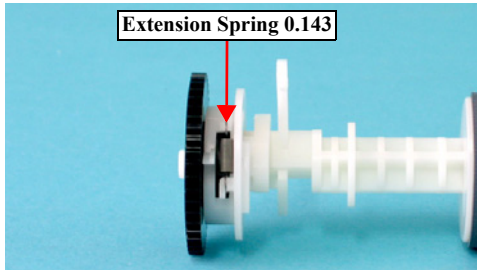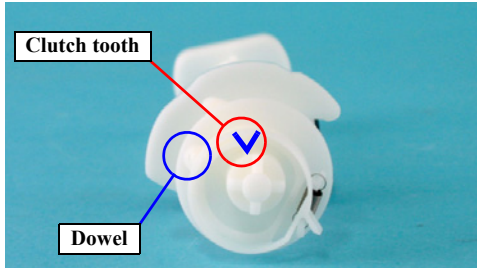
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • —	The drive of the PF Motor is not transmitted to the LD Roller Shaft.	Holder Shaft Unit	1. Check if the Extension Spring 0.143 does not come off in the Clutch mechanism. **Extension Spring 0.143** 	1. Reassemble the Extension Spring 0.143 in the Clutch mechanism.
			2. Check if the Clutch does not come off from the dowel of the LD Roller Shaft. **Clutch tooth** **Dowel** 	2. Reassemble the round portion of the Clutch on the dowel of the LD Roller Shaft.
			3. Check if the Clutch tooth is not damaged.	3. Replace the Holder Shaft Unit with a new one.
			4. Check if the Clutch is not damaged.	4. Replace the Holder Shaft Unit with a new one.

Table 3-15. Check point for the paper out error according to each phenomenon
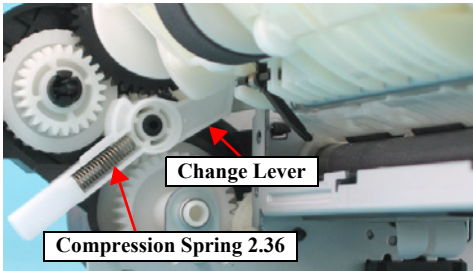
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The drive of the PF Motor is not transmitted to the LD Roller Shaft.	Ink System Unit	1. Check if the Compression Spring 2.36 does not come off in the Change Lever. **Change Lever** **Compression Spring 2.36**	1. Replace the Ink System Unit with a new one.
• Operation • –	The LD Roller is not set to the ASF home position and paper is always loaded from the ASF Unit during the paper loading sequence.	Ink System Unit	1. Check if the tip of the Change Lever is not damaged.	1. Replace the Ink System Unit with a new one.

Table 3-16. Check point for the No ink cartridge/CSIC error/Incorrect ink cartridge according to each phenomenon
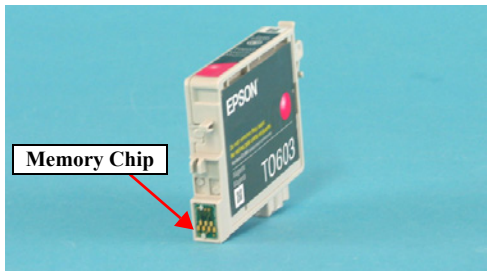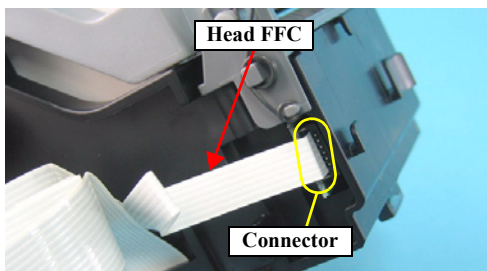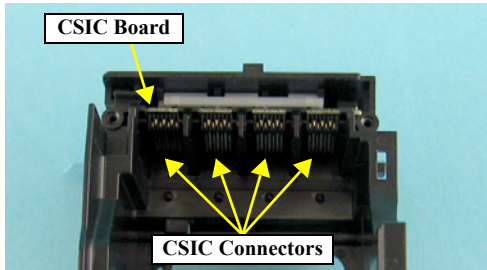
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Inside HP	After the Carriage has detected the HP, an error is displayed.	Ink Cartridge	1. Check if Ink Cartridge is properly installed.	1. Install the Ink Cartridge properly.
			2. Check if the Memory Chip is not disconnected or not chipped. 	2. Replace the Ink Cartridge with a new one.
		CSIC Board	1. Check if the Head FFC is connected to connector on the CSIC Board. 	1. Connect the Head FFC to connector on the CSIC Board.
			2. Check if the CSIC Board is not damaged.	2. Replace the Carriage Unit with a new one.
		CSIC Connector	3. Check if the CSIC Connector is not damaged. 	1. Replace the Carriage Unit with a new one.

Table 3-17. Check point for the paper jam error according to each phenomenon
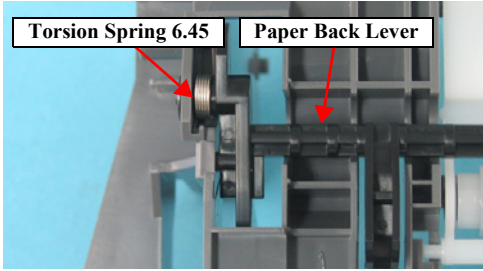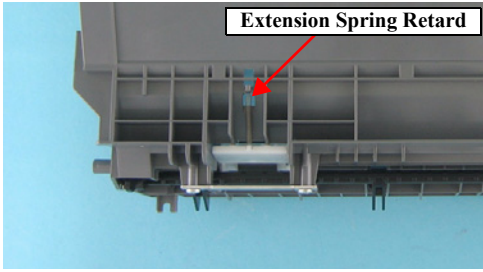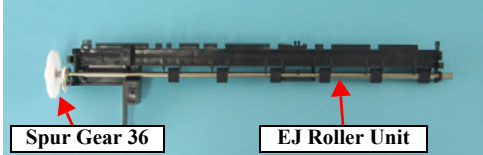
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • Outside HP	The paper feeding sequence is performed without loading paper in the paper loading sequence.	ASF Unit	1. Check if the ASF Unit is properly installed. 2. Check if the Paper Back Lever operates correctly in the paper loading sequence. Torsion Spring 6.45 Paper Back Lever	1. Install the ASF Unit properly. 2. Set the Torsion Spring 6.45 between the ASF Frame and the Paper Back Lever.
		Holder Shaft Unit	1. Check if the Torsion Spring 0.22 is properly installed. PE Sensor Torsion Spring 0.22 PE Sensor Lever	1. Set the Torsion Spring 0.22 between the Holder Shaft and the PE Sensor Lever.

Table 3-17. Check point for the paper jam error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • Outside HP	Paper is being resent during paper feeding operation.	ASF Unit	1. Check if the Extension Spring Retard operates correctly in the paper loading sequence. **Extension Spring Retard**	1. Set the Extension Spring Retard between the Retard Roller Unit and the ASF Frame.
	When turning on the power, the Carriage Unit move to the home position correctly. But, the paper feeding sequence is performed without loading paper in the paper loading sequence.	Holder Shaft Unit*	1. Check if the Torsion Spring 0.22 is properly installed.	1. Set the Torsion Spring 0.22 between the Holder Shaft and the PE Sensor Lever.
• Operation • ─	The leading edge of paper does not go through between the EJ Roller Unit and the Star Wheel.	EJ Frame Unit**	1. Check if the EJ Frame Unit is correctly assembled. **EJ Frame Unit**	1. Reassemble the EJ Frame Unit correctly.
			2. Check if the EJ Roller Unit is correctly assembled. **Spur Gear 36** **EJ Roller Unit**	2. Reassemble the EJ Roller Unit correctly.

* The Carriage Unit can move to home position even if the Torsion Spring 0.22 comes off. However, the PE Sensor Lever keeps the high signal condition in the next operation. Therefore, the paper jam error is detected.

** In case that the paper jam error occurs in each operation, the jammed paper contacts the nozzle surface of the Print Head and the Print Head may be damaged.

Table 3-17. Check point for the paper jam error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The leading edge of paper does not go through between the EJ Roller Unit and the Star Wheel.	EJ Frame Unit**	3. Check if the Star Wheel Holders does not come off. **Star Wheel Holders**	3. Reassemble the Star Wheel Holders correctly.
			4. Check if the Spur Gear 36 is not damaged.	4. Replace the EJ Frame Unit with a new one.
	The leading edge of paper is not loaded to the PF Roller Unit.	Paper Guide Upper Unit **	1. Check if the Paper Guide Upper Unit is correctly assembled. **Paper Guide Upper Unit**	1. Reassemble the Paper Guide Upper Unit to the Main Frame correctly.

** In case that the paper jam error occurs in each operation, the jammed paper contacts the nozzle surface of the Print Head and the Print Head may be damaged.

Table 3-18. Check point for the Fatal error according to each phenomenon
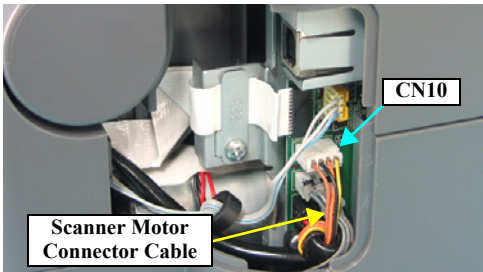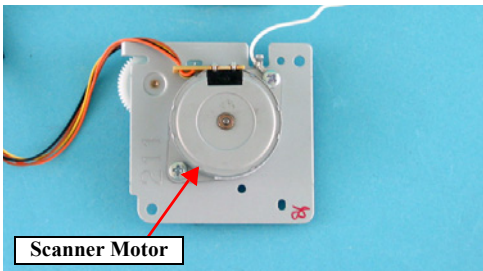
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	The Scanner Unit does not initialize when the power is turned on.	Scanner Motor	1. Check if the Scanner Motor Connector Cable is connected to CN10 on the Main Board. CN10 Scanner Motor Connector Cable	1. Connect the Scanner Motor Connector Cable to CN10 on the Main Board.
			2. Check if the coil resistance of the Scanner Motor is about 37Ω by using the tester *(refer to Table 3-1)*. Scanner Motor	2. Replace the Scanner Motor with a new one.
			3. Check if the Scanner Motor Connector Cable is not damaged.	3. Replace the Scanner Motor with a new one.

Table 3-18. Check point for the Fatal error according to each phenomenon
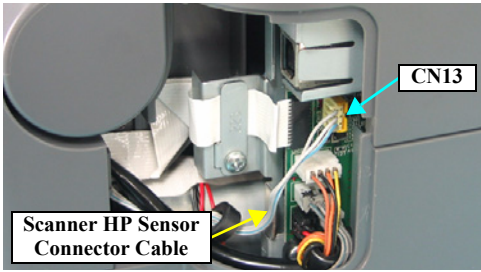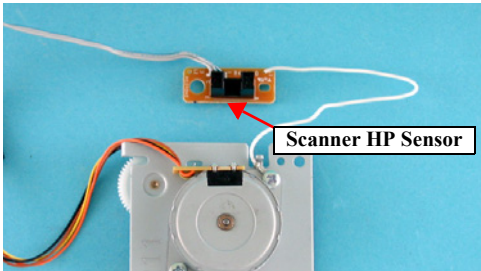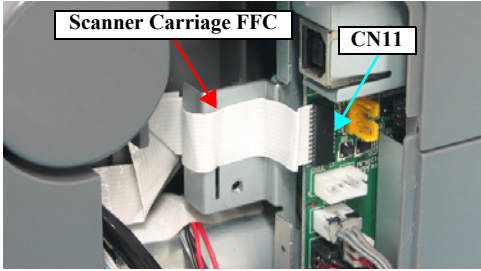
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	The Scanner Unit does not initialize when the power is turned on.	Scanner HP Sensor	1. Check if the Scanner HP Sensor Connector Cable is connected to CN13 on the Main Board. 	1. Connect the Scanner HP Sensor Connector Cable to CN13 on the Main Board.
			2. Check if the Scanner HP Sensor Connector Cable is not damaged.	2. Replace the Scanner HP Sensor with a new one.
			3. Check if the Scanner HP Sensor is not damaged. 	3. Replace the Scanner HP Sensor with a new one.
		Scanner Carriage FFC	1. Check if the Scanner Carriage FFC is connected to CN11 on the Main Board. 	1. Connect the Scanner Carriage FFC to CN11 on the Main Board.
			2. Check if the Scanner Carriage FFC is not damaged.	2. Replace the Scanner Carriage FFC with a new one.

Table 3-18. Check point for the Fatal error according to each phenomenon
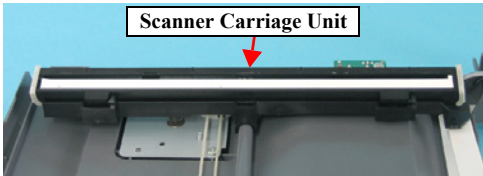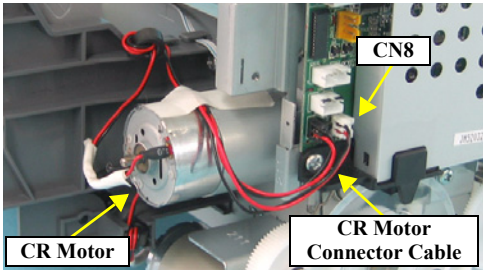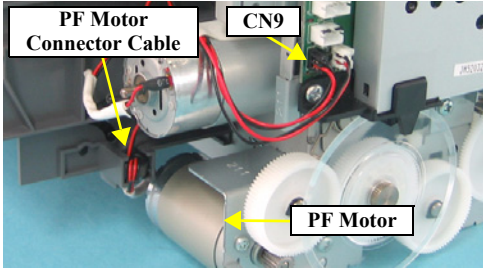
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	The Scanner Unit does not initialize when the power is turned on.	Scanner Carriage Unit	1. Check if the Scanner Carriage Unit is not damaged. 	1. Replace the Scanner Carriage Unit with a new one.
• Power on • Anywhere	When turning on the power, the CR Motor does not operate at all.	CR Motor	1. Check if the CR Motor Connector Cable is connected to CN8 on the Main Board. 	1. Connect the CR Motor Connector Cable to CN8 on the Main Board.
			2. Check if the CR Motor Connector Cable is not damaged.	2. Replace the CR Motor with a new one.
			3. Check if the CR Motor operates.	3. Replace the CR Motor with a new one.
	When turning on the power, the PF Motor does not operate at all.	PF Motor	1. Check if the PF Motor Connector Cable is connected to CN9 on the Main Board. 	1. Connect the PF Motor Connector Cable to CN9 on the Main Board.
			2. Check if the PF Motor Connector Cable is not damaged.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor operates.	3. Replace the PF Motor with a new one.

Table 3-18. Check point for the Fatal error according to each phenomenon
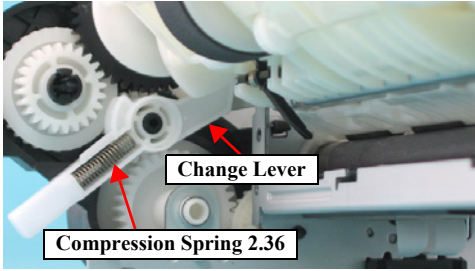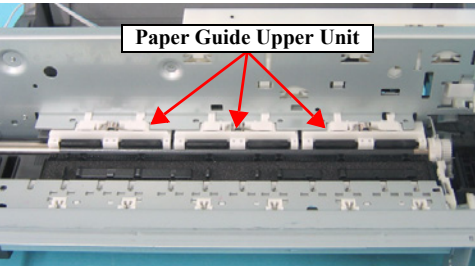
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the Carriage Unit collides to the Change Lever located to the front side of the printer.	PF Motor	1. Check if the PF Motor Connector Cable is connected to CN9 on the Main Board.	1. Connect the PF Motor Connector Cable to CN9 on the Main Board.
			2. Check if the PF Motor Connector Cable is not damaged.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor operates.	3. Replace the PF Motor with a new one.
		Ink System Unit	1. Check if the Compression Spring 2.36 does not come off in the Change Lever. Change Lever Compression Spring 2.36	1. Replace the Ink System Unit with a new one.
• Power on • Anywhere	The Carriage Unit collides with the Guide Upper Unit when power is turned on.	Paper Guide Upper Unit	1. Check if the Paper Guide Upper Unit is correctly assembled. Paper Guide Upper Unit	1. Reassemble the Paper Guide Upper Unit to the Main Frame correctly.

Table 3-18. Check point for the Fatal error according to each phenomenon
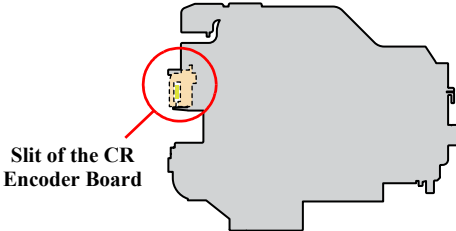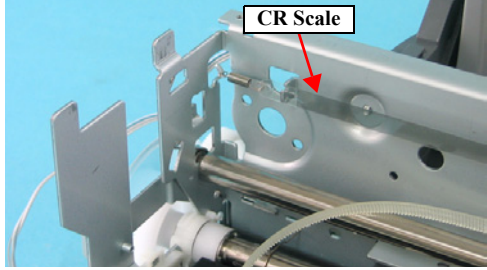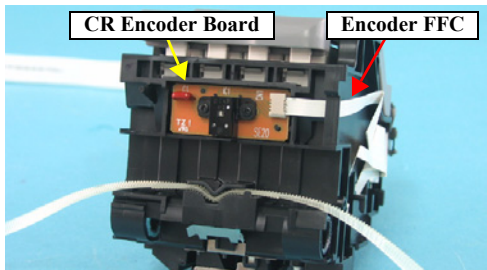
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the Carriage Unit collides to the right side of the Main Frame.	CR Scale	1. Check if the CR Scale does not come off or it properly passes through the slit of the CR Encoder Board. **Slit of the CR Encoder Board**	1. Reassemble the CR Scale correctly. * If the problem is not solved, replace the Main Board with a new one.
			2. Check if the CR Scale is not damaged or contaminated. **CR Scale**	2. Replace the CR Scale with a new one or clean it completely.
		CR Encoder Board	1. Check if the Encoder FFC is connected to the CR Encoder Board. **CR Encoder Board** **Encoder FFC**	1. Connect the Encoder FFC to the CR Encoder Board.
			2. Check if the Encoder FFC is not damaged.	2. Replace the Encoder FFC with a new one.
			3. Check if the CR Encoder Board is not damaged.	3. Replace the CR Encoder Board with a new one.
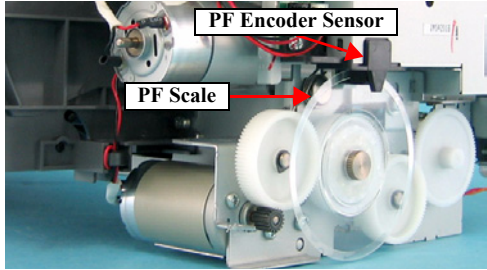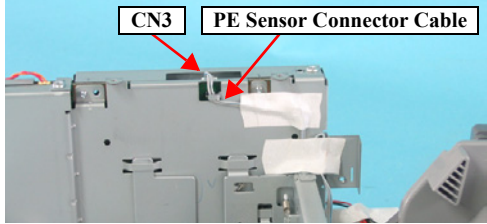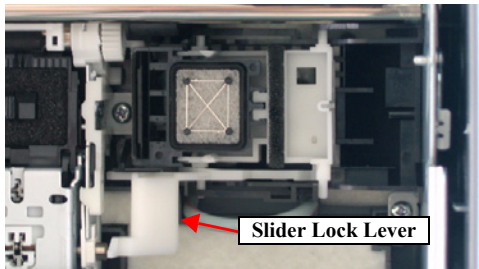
Table 3-18. Check point for the Fatal error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	The eject rollers are rotating at high speed when power is turned on. (For about 1 cycle.)	PF Scale / Main Board Unit	1. Check if the PF Scale is not damaged or contaminated. 	1. Replace the PF Scale with a new one.
			2. Check if the PF Encoder Sensor is not damaged.	2. Replace the Main Board Unit with a new one.
• Operation • Anywhere	The Scanner Carriage Unit does not operate.	Guide Rail of the Housing, Lower	1. Check if the grease is enough on the Guide Rail surface of the Housing, Lower.	1. After wiping the grease on the Guide Rail of the Housing, Lower with a dry, soft cloth, coat it with grease (G-26 Grease). (Refer to Chapter 6 "MAINTENANCE".)
			2. Check if the Guide Rail of the Housing, Lower is set correctly.	2. Reassemble the Guide Rail of the Housing, Lower to the Scanner Carriage Unit.
• Operation • Anywhere	The paper feeding sequence is performed without loading a paper in the paper loading sequence.	Holder Shaft Unit	1. Check if the PE Sensor Connector Cable is connected to CN3 on the Main Board. 	1. Connect the PE Sensor Connector Cable to CN3 on the Main Board.
			2. Check if the PE Sensor Connector Cable is not damaged.	2. Replace the PE Sensor with a new one.
			3. Check if the PE Sensor is not damaged.	3. Replace the PE Sensor with a new one.

Table 3-18. Check point for the Fatal error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • Anywhere	The Carriage Unit climbs over the Slider Lock Lever set to the wiping position and the Carriage Unit collides to its lever.	Front Frame	1. Check if the Slider Lock Lever is correctly released by the CR movement. **Slider Lock Lever**	1. Replace the Front Frame with a new one.
		Main Frame	1. Check if the Slider Lock Lever is correctly released by the CR movement.	1. Replace the Printer Mechanism with a new one.

3.3.1 Superficial Phenomenon-Based Troubleshooting

This section explains the fault locations of the error states (print quality and abnormal noise) other than the error states (LED and STM3) in the previous section.

Table 3-19. Check point for multiple sheets of paper are always loaded without LEDs and STM3
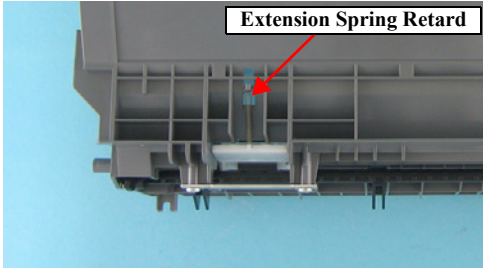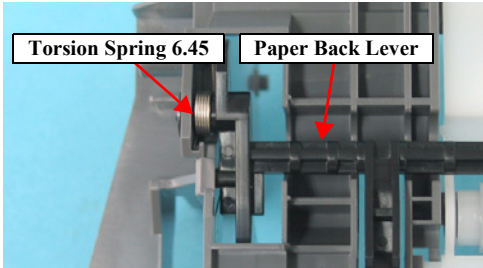
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The LEDs and STM3 are not indicating error conditions. But, multiple sheets of paper are always loaded from the ASF Unit.	ASF Unit	1. Check if the Extension Spring Retard operates correctly in the paper loading sequence. 2. Check if the Paper Back Lever operates correctly in the paper loading sequence. 	1. Set the Extension Spring Retard between the Retard Roller Unit and the ASF Frame. 2. Set the Torsion Spring 6.45 between the ASF Frame and the Paper Back Lever.

Table 3-20. Check point for the abnormal noise

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Anytime • Anywhere	The abnormal noise occurs at the first power on timing and during each operation although the printing operation is performed.	Carriage Unit	1. Check if the grease on the Carriage Guide Shaft is sufficient.	1. Wipe off the remaining grease on the Carriage Guide Shaft and lubricate it on its shaft.
		Front Frame	1. Check if the grease on the Front Frame is sufficient.	1. Wipe off the remaining grease on the Front Frame and lubricate it on its frame.
		Ink System Unit	1. Check if the Change Lever moves smoothly.	1. Replace the Ink System Unit with a new one.
	The bottom of the Carriage Unit contacts the surface of the EJ Frame Unit.	EJ Frame Unit	1. Check if the EJ Frame Unit is not bent up.	1. Replace the EJ Frame Unit with a new one.
	The Carriage Unit collides to the Paper Guide Upper Unit during each operation.	Paper Guide Upper Unit	1. Check if the Paper Guide Upper Unit is attached securely. (check if it interferes with the Carriage Unit)	1. Reassemble the Paper Guide Upper to the Main Frame.

Table 3-21. Check point for poor scanned image quality

Scanned image Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Scanned image is not clear.	There are dusts on the Document Glass. (white dots appear on the scanned image)	Scanner Housing Upper	1. Check if there is not any dust on the Document Glass.	1. Remove the extraneous matter from the Document Glass. (Refer to the Chapter 6 "MAINTENANCE".)
	There are dusts on the LED in the Rod Lens Array. (vertical stripes appear on the scanned image)	Scanner Carriage Unit	1. Check if there is not any dust on the LED.	1. Remove the extraneous matter from the Document Glass (blow away the dusts).
	The LED of Scanner Carriage Unit does not light up.	Scanner Carriage Unit	1. Check if the LED lights up.	1. Replace the Scanner Carriage Unit with new one.

Table 3-22. Check point for the poor printing quality
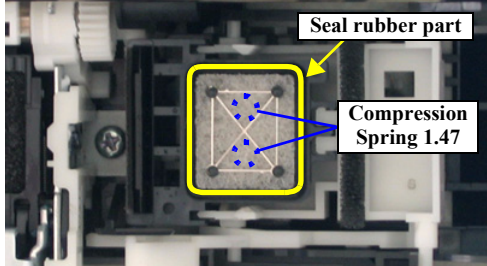
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Dot missing and mixed colors	Ink is scarcely ejected to the Cap from the Print Head.	Ink System Unit (Cap Unit)	1. Check if there is not any foreign material/damage around the seal rubber part on the Cap Unit. 	1. Remove the foreign material around the seal rubber parts carefully.
			2. Check if the Compression Spring 1.47 is correctly mounted on the Cap Unit.	2. Replace the Ink System Unit with a new one.
	Ink is ejected to the Cap from the Print Head, but the SPC does not recover from the error after cleaning or ink change.	Print Head	1. Check if it returns to normal by performing CL operation or replacing the Ink Cartridge.	1. Perform CL operation and the Ink Cartridge replacement specified times. If it doesn't work, change the Print Head with a new one.
			2. Check if the Print Head is not damaged.	2. Replace the Print Head with a new one.
		Cleaner Blade	1. Check if the Cleaner Blade does not have paper dust or bending.	1. Replace Ink System Unit with a new one.
		Main Board	1. Check if the Main Board is not damaged.	1. Replace the Main Board with a new one.

Table 3-22. Check point for the poor printing quality
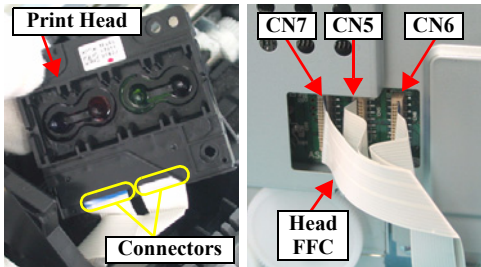
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak / abnormal discharge	Ink is ejected to the Cap from the Print Head, but printing is not done at all after cleaning or ink change, or abnormal discharge occurs.	Head FFC	1. Check if the Head FFC is securely connected to the Print Head Connectors and the Main Board Connectors (CN5, CN6, CN7).	1. Connect the Head FFC to the Print Head and the Main Board Connectors.
			2. Check if the Head FFC is not damaged.	2. Replace the Head FFC with a new one.
		Print Head	1. Check if it returns to normal by performing CL operation or replacing the Ink Cartridge.	1. Perform CL operation and the Ink Cartridge replacement specified times. If it doesn't work, change the Print Head with a new one.
		Main Board Unit	1. Check if the Main Board is not damaged.	1. Replace the Main Board Unit with a new one.

Table 3-22. Check point for the poor printing quality
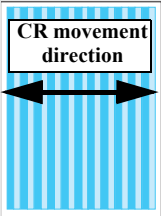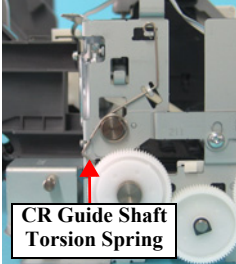
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak/ color unevenness occurrence	Vertical banding appears against the CR movement direction. And, it looks like uneven printing. **CR movement direction** ←→ [Note] If the problem is not solved, replace the CR Motor with a new one.	Adjustment	1. For printing in the Bi-D mode, check if Bi-D Adjustment has been performed properly.	1. Perform Bi-D Adjustment to eliminate displacements between the upper and lower rules. (Refer to Chapter 5 "ADJUSTMENT".)
		Print Head	1. Check if each segment is printed correctly in the Nozzle Check Pattern.	1. Perform Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 "ADJUSTMENT".) If the problem is not solved, replace the Print Head with a new one.
		Carriage Unit / Carriage Guide Shaft	1. Check if there is not any foreign material on the surface of the Carriage Guide Shaft.	1. Remove foreign objects from surface of the Carriage Guide Shaft.
			2. Check if the Carriage Guide Shaft is properly secured to Main Frame by the CR Guide Shaft Torsion Spring and the CR Guide Shaft Pressing Spring. **CR Guide Shaft Torsion Spring** **CR Guide Shaft Pressing Spring**	2. Reassemble the Carriage Guide Shaft correctly.
			3. Check if the grease is enough on the surface of the Carriage Guide Shaft.	3. After wiping the grease on the Carriage Guide Shaft and the Carriage with a dry, soft cloth, coat it with grease (KEN Grease). (Refer to Chapter 6 "MAINTENANCE".)
			4. Check if any damage is not observed on the surface of the Carriage Guide Shaft.	4. Replace the Carriage Guide Shaft with a new one.
		Front Frame	1. Check if there is not any foreign material on the surface of the Front Frame.	1. Remove foreign matter from the Front Frame.
			2. Check if the Front Frame is lubricated with enough grease.	2. After wiping the grease on the Front Frame with a dry, soft cloth, coat it with grease (KEN Grease). (Refer to Chapter 6 "MAINTENANCE".)
			3. Check if the Front Frame has not been deformed.	3. Replace the Front Frame with a new one.

Table 3-22. Check point for the poor printing quality
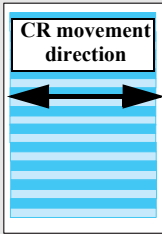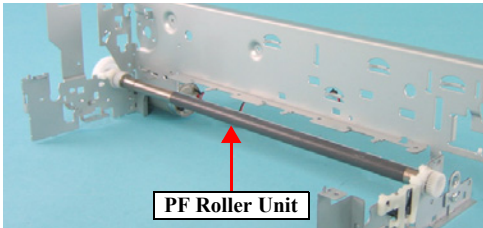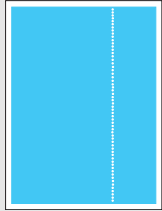
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak/ color unevenness occurrence	Micro banding appears horizontally against the CR movement direction and it appears with the same width. **CR movement direction** ⟷ [Note] If the problem is not solved, replace the PF Motor with a new one.	Printer driver & exclusive paper	1. Check if the suitable paper is used according to the printer driver setting.	1. Use the suitable paper according to the printer driver setting.
		Print Head	1. Check if each segment is printed correctly in the Nozzle Check Pattern.	1. Perform the Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 "ADJUSTMENT".) If the problem is not solved, replace the Print Head with a new one.
		PF Roller Unit	1. Check if there is not any foreign material on the surface of the PF Roller Unit. **PF Roller Unit**	1. Clean the surface of the PF Roller Unit carefully with the soft cloth.
			2. Check if the PF Roller Unit is not damaged.	2. Replace the PF Roller Unit with a new one.
	The Star wheel mark against the CR movement direction.	EJ Frame Unit	1. Check if the Star Wheel Holder does not come off.	1. Reassemble the Star Wheel Holder correctly.
			2. Check if the surface of the EJ Frame Unit is flat.	2. Replace the EJ Frame Unit with a new one.
	Printing is blurred.	Printer driver & exclusive paper	1. Check if the suitable paper is used according to the printer driver setting.	1. Use the suitable paper according to the printer driver setting.
		Print Head	1. Check if the correct Head ID is stored into the EEPROM by using the Adjustment Program.	1. Input 13 digits code of the Head ID into the EEPROM by using the Adjustment Program.

Table 3-22. Check point for the poor printing quality
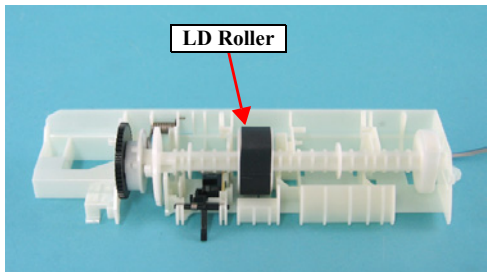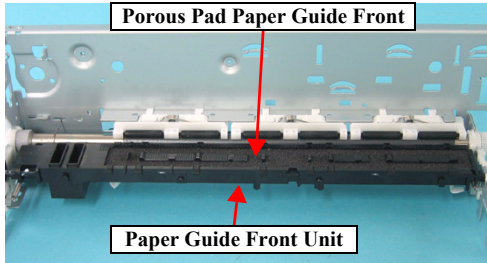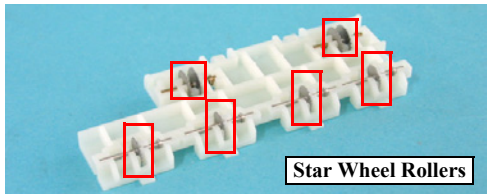
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Print start position slip	The printing operation is correctly performed. But, the top margin is insufficient than usual one.	Holder Shaft Unit	1. Check if any paper dust is not adhered to the surface of the LD Roller. **LD Roller**	1. Set a cleaning sheet in the ASF up side down. Then holding the top edge, try to load the paper from the Printer driver. The micro pearl on the LD Roller surface is removed. To remove severe smear, staple a cloth moistened with alcohol to a post card and clean the roller in the same manner. As for the cleaning sheet, refer to page 99 "Remedy of the Paper out error" * If the problem is not solved, replace the Holder Shaft Unit with a new one.
• Ink stain of paper	Ink stain occurs at the back, top end or bottom end of the print paper.	Paper Guide Front Unit	1. Check if the Paper Guide Front Unit does not have the ink stain. **Porous Pad Paper Guide Front** **Paper Guide Front Unit**	1. Clean the Paper Guide Front Unit with a soft cloth.
			2. Check if heaps of ink are not formed on Porous Pad Paper Guide Front.	2. Replace the Paper Guide Front Unit with a new one.
		EJ Frame Unit	1. Check if the EJ Roller Unit does not have the ink stain.	1. Clean the EJ Roller Unit with a soft cloth.
		PF Roller Unit	1. Check if the PF Roller Unit does not have the ink stain.	1. Clean the PF Roller Unit with a soft cloth.

Table 3-22. Check point for the poor printing quality

Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Ink stain of paper	Ink sticks to other than the print area of the paper, resulting in contamination	Print Head	1. Check if the Print Head Cover does not have the ink drop.	1. Clean the Print Head Cover carefully with a soft cloth.
		Paper Guide Upper Unit	1. Check if the Paper Guide Upper Unit does not have the ink stain.	1. Clean the Paper Guide Upper Unit with a soft cloth.
		EJ Frame Unit	1. Check if the Star Wheel Rollers does not have the ink stain. Star Wheel Rollers	1. Clean the Star Wheel Rollers with a soft cloth.

DISASSEMBLY/ASSEMBLY

4.1 Overview

This section describes procedures for disassembling the main components of the Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850. Unless otherwise specified, disassembly units or components can be reassembled by reversing the disassembly procedure. Things, if not strictly observed, that could result in injury or loss of life are described under the heading "Warning". Precautions for any disassembly or assembly procedures are described under the heading "CAUTION". Tips for disassembling procedures are described under the heading "CHECK POINT". If the assembling procedure is different from the reversed procedure of the disassembling, the procedure is described under the heading "REASSEMBLY". Any adjustments required after reassembling the units are described under the heading "ADJUSTMENT REQUIRED". When you have to remove any units or parts that are not described in this chapter, refer to the exploded diagrams in the appendix.

Read precautions described in the next section before starting work.

4.1.1 Precautions

See the precautions given under the heading "WARNING" and "CAUTION" in the following column when disassembling or assembling Stylus CX4100/CX4200/CX4700/CX4800/DX4200/DX4800/DX4850.

WARNING	■ **Disconnect the power cable before disassembling or assembling the printer.** ■ **If you need to work on the printer with power applied, strictly follow the instructions in this manual.** ■ **Wear protective goggles to protect your eyes from ink. If ink gets in your eye, flush the eye with fresh water and see a doctor immediately.** ■ **Always wear gloves for disassembly and reassembly to avoid injury from sharp metal edges.** ■ **To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.** ■ **Never touch the ink or wasted ink with bare hands. If ink comes into contact with your skin, wash it off with soap and water immediately. If irritation occurs, contact a physician.**

CAUTION	■ **When transporting the printer after installing the ink cartridge, be sure to pack the printer for transportation without removing the ink cartridge.** ■ **Use only recommended tools for disassembling, assembling or adjusting the printer.** ■ **Observe the specified torque when tightening screws.** ■ **Apply lubricants as specified. (Refer to "6.1.3 Lubrication (p190)" for details.)** ■ **Make the specified adjustments when you disassemble the printer. (Refer to Chapter5 ADJUSTMENT for details.)** ■ **Make sure the tip of the waste ink tube is located at correct position when reassembling the waste ink tube. Otherwise it will cause ink leakage.** ■ **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

4.1.2 Tools

Use only specified tools to avoid damaging of the printer.

Table 4-1. Tools

Name	Supplier*	Part No.
Phillips Screwdriver (No.1)	EPSON	1080530
Phillips Screwdriver (No.2)	EPSON	1080532
Flathead Screwdriver	EPSON	1080527
Precision Screwdriver #1 (-)	EPSON	1080525
Tweezer	EPSON	1080561
Longnose pliers	EPSON	1080564
Acetate Tape	EPSON	1003963

Note *:   Available in the market

4.1.3 Work Completion Check

If any service is made to the printer, use the checklist shown below to confirm all works are completed properly and the printer is ready to be returned to the user.

Table 4-2. Work Completion Check

Classification	Part	Check Item	Check Column
Printer unit	Self test	Operation is normal?	□OK / □NG
	On line test	Print is normally done?	□OK / □NG
	Print Head (nozzle check pattern print)	Ink gets out normally from all the nozzles?	□OK / □NG
	CR mechanism	CR smoothly operates?	□OK / □NG
		CR makes abnormal sound during its operation?	□OK / □NG
	Paper loading mechanism	Paper is smoothly loaded?	□OK / □NG
		Paper jam does not happen?	□OK / □NG
		Paper does not warp during paper loading?	□OK / □NG
		Multiple papers are not fed?	□OK / □NG
		Abnormal sound is not heard during paper loading?	□OK / □NG
		There is no obstacles at paper route?	□OK / □NG

Table 4-2. Work Completion Check

Classification	Part	Check Item	Check Column
Scanner unit	Mechanism	Glass surface is not dirty?	□OK / □NG
		Alien substance is not mixed in the CR movement area?	□OK / □NG
	CR mechanism	CR smoothly operates?	□OK / □NG
		CR operates together with scanner unit?	□OK / □NG
		CR makes abnormal sound during its operation?	□OK / □NG
	LED	LED normally turns on and white reflection test is done near home position?	□OK / □NG
On line test	On line test	Operation is normal?	□OK / □NG
Copy	Copy	Local copy is normal?	□OK / □NG
Adjustment	Designated adjustment items	Adjustment condition is suitable?	□OK / □NG
Lubrication	Designated lubrication items	Lubrication is done at designated place?	□OK / □NG
		Lubrication volume is suitable?	□OK / □NG
Function	Firmware version	The newest version	□OK / □NG
Dispatch packing	Ink cartridge	Ink cartridge is normally installed?	□OK / □NG
	Waste Ink Pads	Remaining life of waste ink pads are sufficient?	□OK / □NG
	Protection during distribution	Printer CR is in the cap position?	□OK / □NG
Others	Attached goods	All of attached goods from users are packed?	□OK / □NG

4.1.4 Differences in Disassembling Procedures Concerning Models With or Without the Card Slot
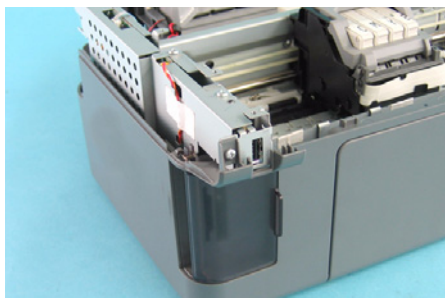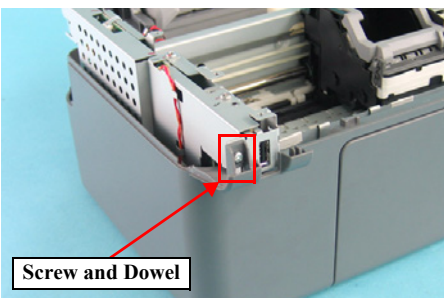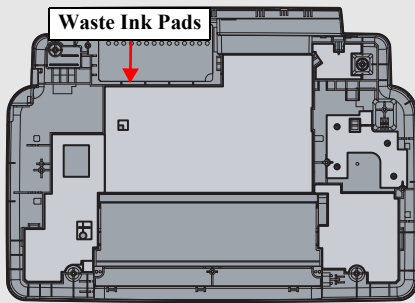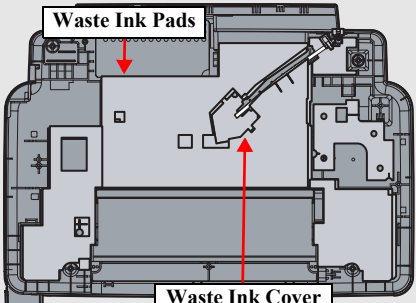
Some parts that are installed to Stylus CX4700/CX4800/DX4800/DX4850(Card slot model) and Stylus CX4100/CX4200/DX4200
(Model with no card slot) differ from each other because of the absence or presence of the card slot.

> **CHECK POINT** ✓
> **As for common parts among the card slot model and the model with no card slot, descriptions and pictures in this section are based on the card slot model.**

Procedures concerning the model with no card slot are mentioned under the heading "CHECK POINT". Refer to the table below when disassembling the model with no card slot, and perform the maintenance work in confirmation of these differences.

Table 4-3. Differences in Disassembling Procedures Concerning Models With or Without the Card Slot

Item	Description	Stylus CX4700/CX4800/DX4800/DX4850 (Card slot model)	Stylus CX4100/CX4200/DX4200 (Model with no card slot)	Reference
Card slot unit is not installed	The model with no card slot has a screw and a dowel on the left side of the printer.		Screw and Dowel	**"4.6.1 Printer Mechanism (p167)"**
Disassembling procedure concerning waste ink pads	As the model with no card slot has a waste ink cover, shape of the waste ink pads and the disassembling procedure differ from the ones of the card slot model.	Waste Ink Pads	Waste Ink Pads / Waste Ink Cover	**"4.6.2 Waste Ink Pads (p169)"**

4.2 Caution regarding Assembling/Disassembling of the Printer Mechanism, and How to Ensure of Quality on Re-assembled Product

On current low end models, we basically forbade to remove Housing Lower from Printer Mechanism in your repair. This is because there is a possibility of Main Frame deformation when a part (such as Ink System Unit) is removed from Printer Mechanism without Housing Lower.

For this reason, we recommend that a new Printer Mechanism be replaced along with the Housing Lower when a part cannot be replaced without removing the Printer Mechanism.

On these models, you have to remove Housing Lower from Printer Mechanism when replacing [Waste Ink Pads] with new one.

Therefore, we clarify caution regarding assembling/disassembling of the Printer Mechanism without Housing Lower, and how to ensure of quality on repaired production this section.

[Caution regarding assembling/disassembling of the Printer Mechanism]

1) Main Frame

   (a) Control of assembled standard position.

     [Reason]

     • The assembled accuracy of each part composed of Printer Mechanism is based on Housing Lower.

     [Service treatment]

     • Confirm that there is no gap between Main Frame and Housing Lower.

     [Reference]

     • To ensure the assembled accuracy, you have to control the assembled standard position of main frame against X/Y/Z-axis direction.

     [X-axis direction]

     • Make sure that main frame is correctly placed on the groove of Housing Lower.

     • Make sure that there is no gap between Main Frame and Housing Lower.

     [Y-axis direction]

     • Make sure that main frame is correctly placed on the groove of Housing Lower.

     • Make sure that there is no gap between Main Frame and Housing Lower.

     [Z-axis direction]

     • Align dowel of Housing Lower with positioning hole of Main Frame and ensure there is no gap.

   (b) How to assemble of ASF Unit/Main Board Unit/Paper Guide Upper Unit

     [Reason]

     • There is a possibility that main frame deformation is caused extra force in assembling. As the result, printing failure/operation failure occurs.

     [Service treatment]

     • Hold the opposite side by hand while you are installing the above parts.

2) CR Guide Frame

   (a) Control of vertical level

     [Reason]

     • There is a possibility that printing failure occurs by CR Guide Frame deformation.

     [Service treatment]

     • Handle Front Frame in assembling/disassembling carefully.

3) Carriage Unit

   (a) Handling of Carriage Unit

     [Reason]

     • If Carriage Unit is damaged in assembling/disassembling of your repair, there is a possibility that vital problem occur in user's further operation.

     [Service treatment]

     • Handle Carriage Unit in assembling/disassembling carefully.

[How to ensure of quality on re-assembled product]

   We judge that the quality of re-assembled product is ensured if there is no problem about the print result by adjustment program.

4.3 Disassembly Procedures

The flowchart below shows step-by-step disassembly procedures. When disassembling each unit, refer to the page number shown in the figure.

```
                        START

"4.4.1 Document Cover/Document        "4.4.2 Paper Support Assy." (p128)        "4.4.3 Stacker Assy." (p128)
  Cover Mat/ ASF Cover" (p127)

"4.4.4 Scanner Unit" (p129)

"4.4.5 Panel Unit" (p130)             "4.5.1 Scanner Housing, Upper" (p163)

"4.4.6 Housing, Upper" (p131)         "4.5.2 Scanner Carriage Unit" (p164)    "4.5.3 Scanner Motor Unit/Scanner HP Sensor/
                                                                                  Driven Pulley" (p166)

"4.4.8 Printer Mechanism" (p134)      "4.4.7 Printhead" (p132)

"4.4.11 Main Board Unit/Card Slot Unit"   "4.4.9 PS Board Unit" (p137)     "4.4.10 Waste Ink Pads/Stacker Lock/PG        "4.4.12 ASF Unit" (p144)
  (p141)                                                                       Lever/Rubber Feet" (p138)

"4.4.16 CR Guide Frame" (p149)        "4.4.18 PF Motor" (p151)                                                        "4.4.13 Holder Shaft Unit" (p146)

"4.4.17 CR Motor" (p150)

"4.4.19 Carriage Unit/CR Encoder Board/PW
  Sensor Board/Head FFC" (p152)

"4.4.21 Front Frame" (p156)           "4.4.20 Paper Guide Upper Unit" (p155)

"4.4.22 EJ Frame Unit" (p157)                                                                                          "4.4.23 Ink System Unit" (p159)

"4.4.24 Paper Guide Front Unit" (p160)

"4.4.25 PG Sensor" (p161)             ■ To remove the "Ink System Unit", all parts shown in the red boxes need to be removed.

"4.4.26 PF Roller Unit" (p162)        ■ To remove the "Paper Guide Front Unit", all parts shown in the red boxes need to be removed.
```

Figure 4-1. Disassembling Flowchart

4.4 Printer Section

4.4.1 Document Cover/Document Cover Mat/ ASF Cover
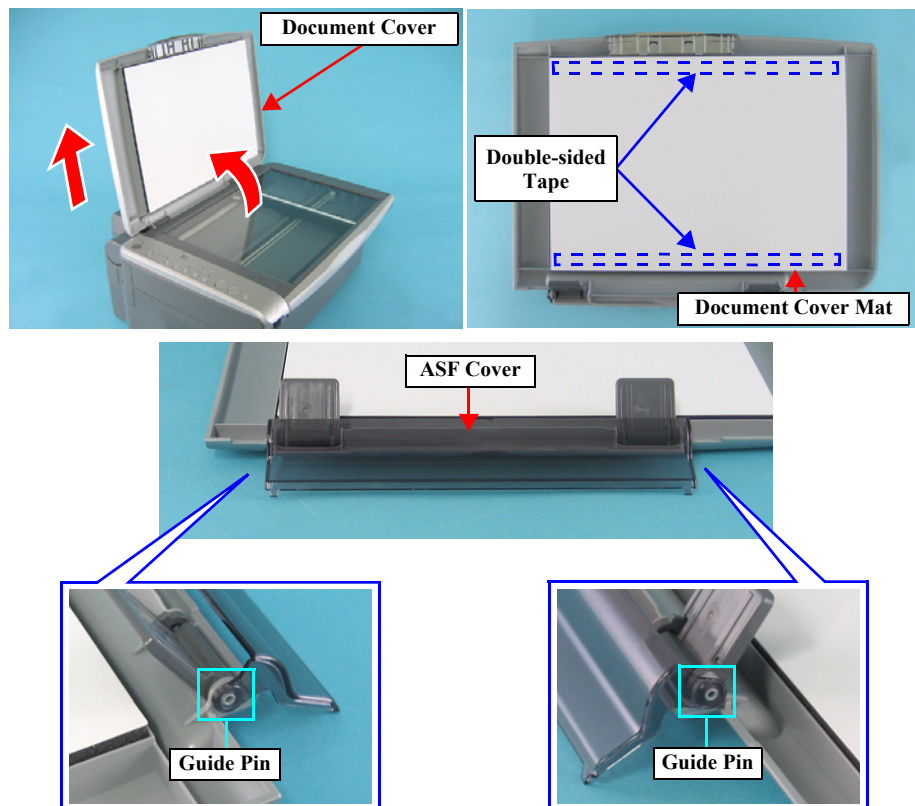
Figure 4-2. Removing Document Cover/Document Cover Mat/ ASF Cover

☐ **Part/Unit that should be removed before removing Document Cover/ Document Cover Mat/ASF Cover**

None

☐ **Removal procedure**

■ Document Cover

1. Open the Document Cover and remove it by pulling out upward.

■ Document Cover Mat

1. Remove the Document Cover Mat that is secured to the Document Cover with the double-sided tapes (x2).

■ ASF Cover

1. Release the guide pins (x2, ☐) that secure the ASF Cover, and remove it from the Document Cover.

4.4.2 Paper Support Assy.

☐ **External view**
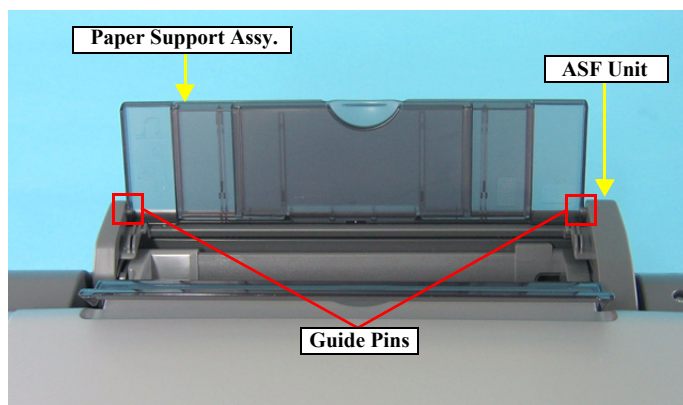
Figure 4-3. Removing Paper Support Assy.

☐ **Part/Unit that should be removed before removing Paper Support Assy.**

None

☐ **Removal procedure**

1. Release the guide pins (x2, ☐) that secure the Paper Support Assy, and remove the Paper Support Assy. from the Housing, Upper.

4.4.3 Stacker Assy.

☐ **External view**
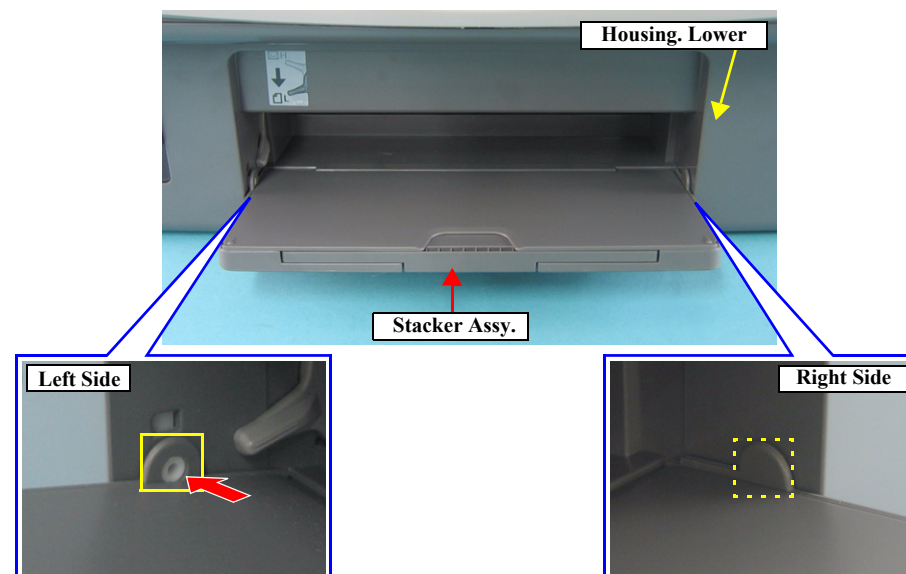
Figure 4-4. Removing Stacker Assy.

☐ **Part/Unit that should be removed before removing Stacker Assy.**

None

☐ **Removal procedure**

1. Open the Stacker Assy.

2. Release the guide pin (x1, ☐) that secures the Stacker Assy. with a precision screwdriver (-), and remove Stacker Assy.

4.4.4 Scanner Unit

☐ **External view (1)**
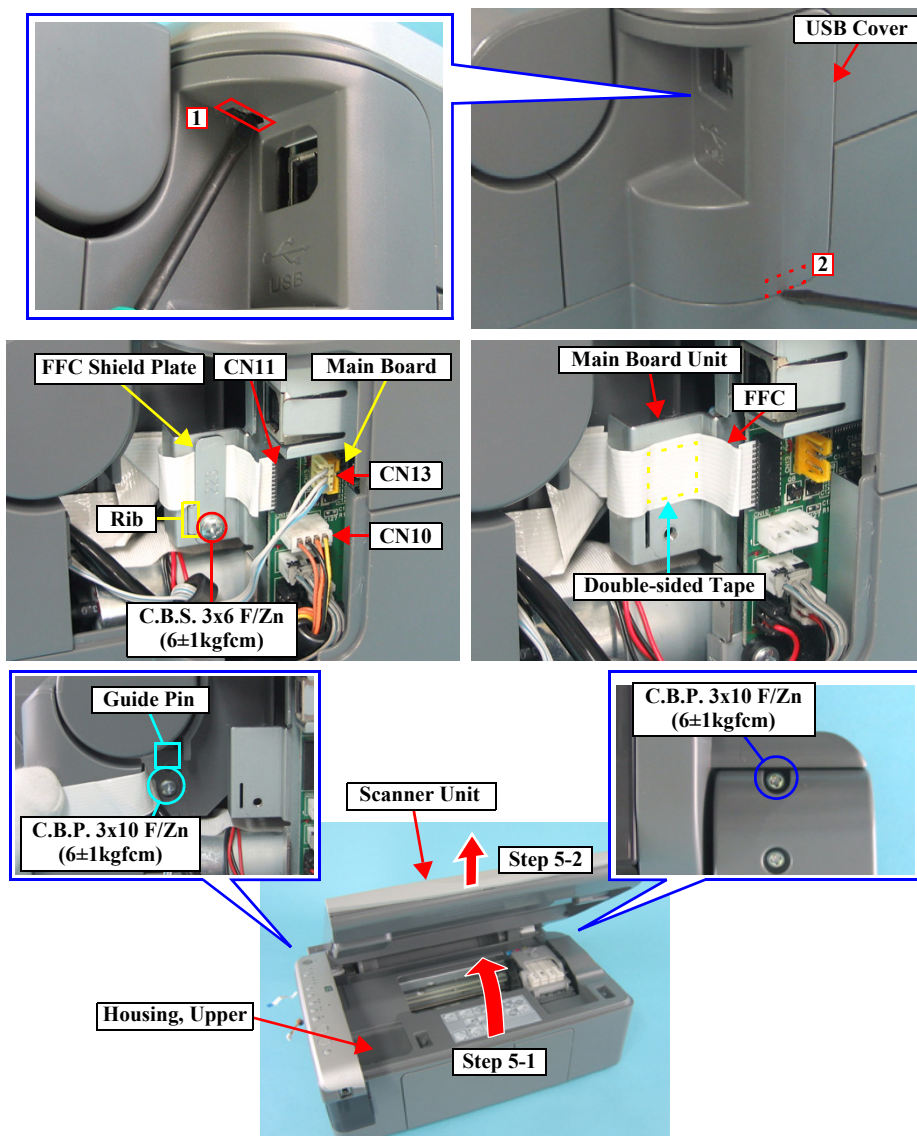
Figure 4-5. Removing Scanner Unit

☐ **Part/Unit that should be removed before removing Scanner Unit**

Document Cover

☐ **Removal procedure**

1. Release the tabs (x2, **1 2**) that secure the USB Cover with a precision screwdriver (-), and remove the USB Cover.

2. Remove the screw (x1, ⭕) that secure the FFC Shield Plate, and remove the FFC Shield Plate.

3. Disconnect the following Connector Cables and FFC from the connectors on the Main Board.

- CN10: Scanner Motor Connector Cable
- CN11: Scanner Carriage FFC
- CN13: Scanner HP Sensor Connector Cable

CAUTION

- **Do not damage the Scanner Carriage FFC when removing/ installing the screw (⭕).**
- **The Scanner Carriage FFC is fastened with the double-sided tape, so be careful not to damage the FFC when removing it.**

4. Remove the screws (x2, ⭕⭕) that secure the Scanner Unit.

5. Open the Scanner Unit, and remove it by pulling out upward.

REASSEMBLY

- **Do not pinch the FFC or any Connector Cables between the Scanner Unit and the Housing, Upper.**
- **Route the Scanner HP Sensor Connector Cable around the channel of Hinge L.**
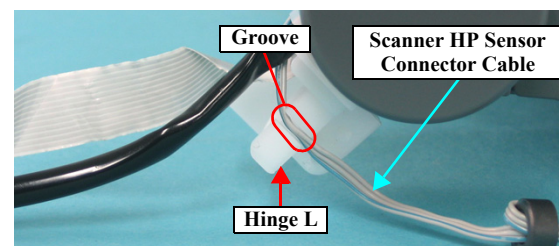
Figure 4-6. Routing Connector Cable

- **Align the guide pin (x1, ⬜) of the Scanner Unit and the positioning hole (x1) of the Housing Upper.**
- **Insert the rib (x1) of the FFC Shield Plate into the notch (x1, ⬜).**

4.4.5 Panel Unit

☐ External view
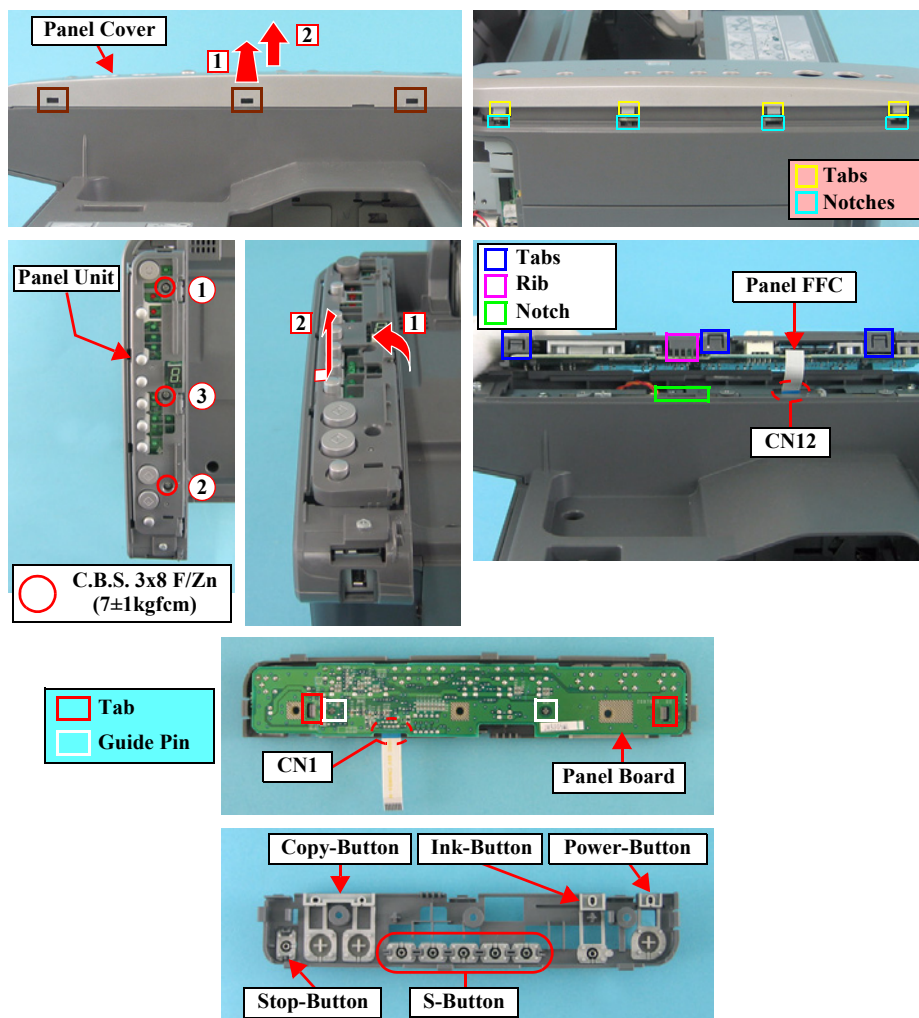
Figure 4-7. Removing Panel Unit

☐ **Part/Unit that should be removed before removing Panel Unit**

Document Cover / Scanner Unit

☐ **Removal procedure**

CAUTION ⚠	When performing the following work, be careful not to bend the tabs (x3, ☐) of the Panel Unit.

1. Release the tabs (x3, ☐) that secure the Panel Cover with a precision screwdriver (-), and remove the Panel Cover in the order shown in the figure.
2. Remove the screws (x3, ◯) that secure the Panel Unit.
3. Release the hooks (x3, ☐) of the Panel Unit in the order shown in the figure.

CHECK POINT ✔	When removing the Panel Unit, disconnect the Panel FFC from the Main Board side (CN12).

4. Disconnect the Panel FFC from the Main Board Connector (CN12), and remove the Panel Unit.
5. Release the tabs (x2, ☐) that secure the Panel Board, and remove the Panel Board.
6. Disconnect the Panel FFC from the connector (CN1) of the Panel Board.
7. Remove S-Buttons (x5), Copy-Button, Stop-Button, Ink-Button, and Power-Button from the Panel Housing.

REASSEMBLY ↩	■ When installing the Panel Board to the Panel Housing, match the guide pins (x2, ☐) of the Panel Housing with the positioning holes (x2) of the Panel Board.
	■ When installing the Panel Unit to the Housing, Upper, match the notch (x1, ☐) of the Housing, Upper with the rib (x1, ☐) of the Panel Unit. The notches of the Housing, Upper should also be matched with the tabs (x3, ☐) of the Panel Unit.
	■ Tighten the screws in the order as shown in the figure.
	■ When installing the Panel Cover, match the tabs (x4, ☐) of the Panel Cover and the notches (x4, ☐) of the Panel Unit.

4.4.6 Housing, Upper

☐ **External view**
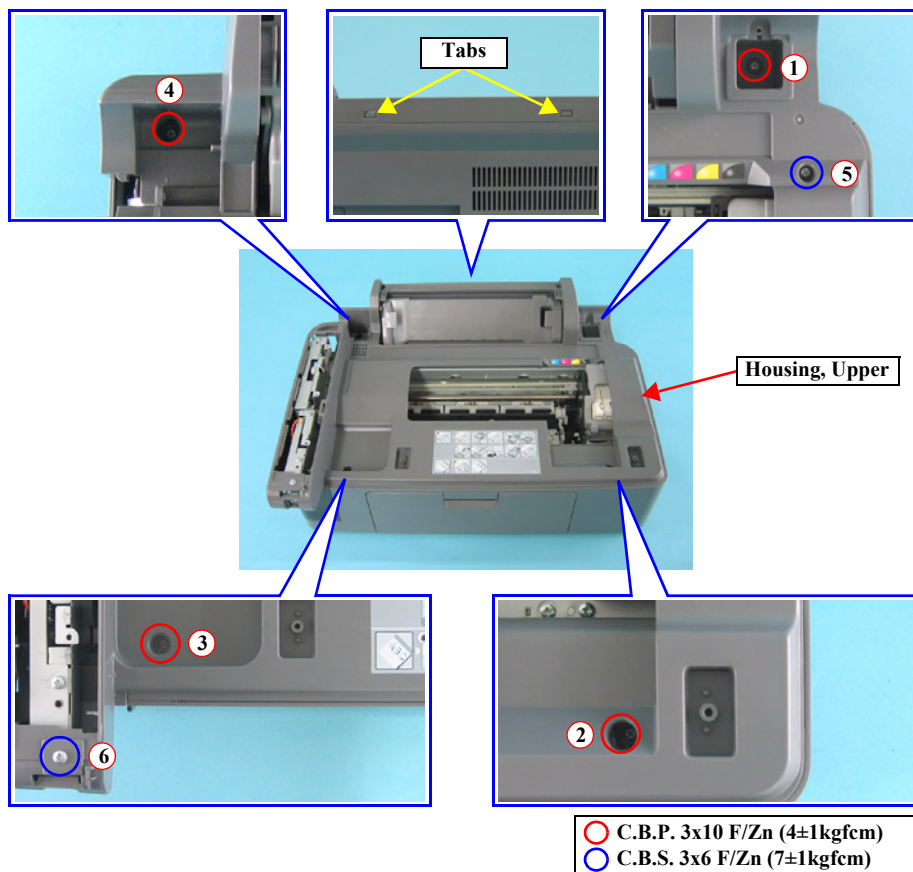
Figure 4-8. Removing Housing, Upper

☐ **Part/Unit that should be removed before removing Housing, Upper**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit

☐ **Removal procedure**

1. Remove the screws (x6, ⭕🔵) that secure the Housing, Upper.
2. Release the tabs (x2) that secure the Housing, Upper with a flathead screwdriver or a similar tool, and lift up to remove the Housing, Upper.

> **REASSEMBLY** **Tighten the screws in the order as shown in the figure.**

4.4.7 Printhead

□   **External view**
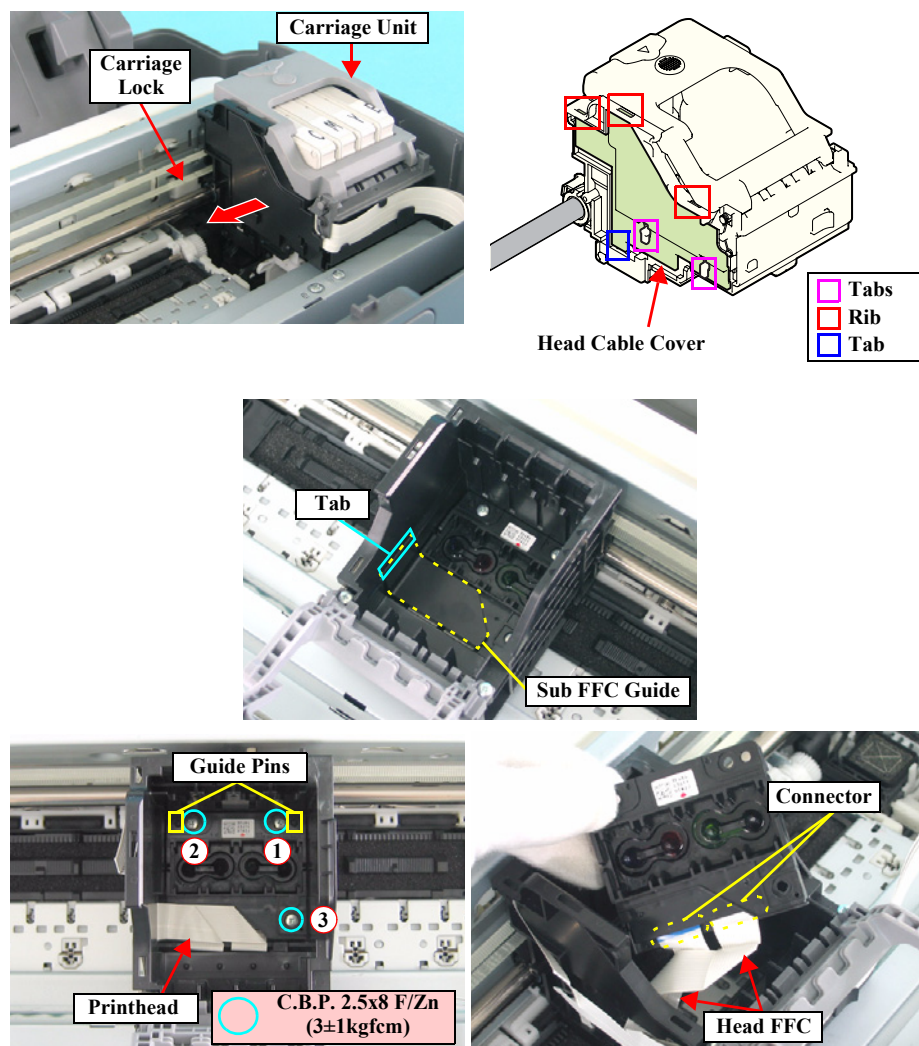
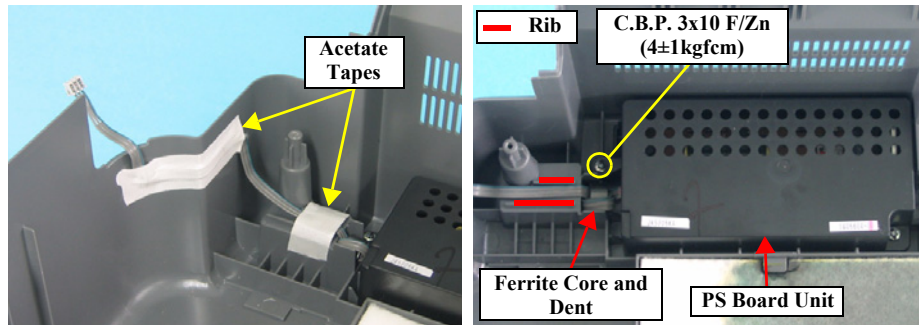**Figure 4-9. Removing Printhead**

□   **Part/Unit that should be removed before removing Print Head**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper

□   **Removal procedure**

1.   Release the Carriage Lock with a flathead screwdriver or a similar tool, and move the Carriage Unit to the center of the printer.

2.   Remove all the Ink Cartridges from the Carriage Unit.

> **CAUTION** ⚠
> **When performing the following work, be careful not to bend the tabs (□) of the Carriage Unit.**

3.   Release the tab (x1, □) on the downside of the Head Cable Cover with a precision screwdriver (-), slide the Cover downward, and remove the Head Cable Cover.

4.   Release the tab (x1, □) that secures the Sub FFC Guide with a precision screwdriver (-), and remove the Sub FFC Guide.

> **CAUTION** ⚠
> **Do not touch or damage the nozzles or the ink supply needles of the Printhead.**

5.   Remove the screws (x3, ○) that secure the Print Head, and lift up to remove Printhead with a longnose pliers.

6.   Disconnect the Head FFCs (x2) from the connectors (x2) of the Print Head, and remove the Printhead.

REASSEMBLY

■ **When installing the Printhead to the Carriage Unit, match the guide pins (x2, ☐) of the Carriage Unit with the positioning holes (x2) of the Printhead.**

■ **Tighten the screws in the order as shown in the figure.**

■ **When installing the Sub FFC Guide, insert the rib of the Sub FFC Guide to the notch of the Carriage Unit as shown below.**
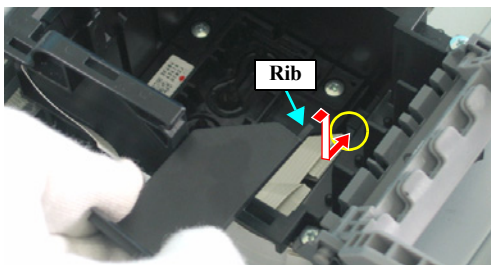
Figure 4-10. Installing Sub FFC Guide

ADJUSTMENT REQUIRED

After removing/replacing the Printhead, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")

1. **"PG Adjustment"**
2. **"Ink Charge"** (only after replacement)
3. **"Head ID Input"** (only after replacement)
4. **"Head Angular Adjustment"**
5. **"Bi-D adjustment"**
6. **"PW Sensor Adjustment"**
7. **"First Dot Adjustment"**

4.4.8 Printer Mechanism

☐ **External view (1)**
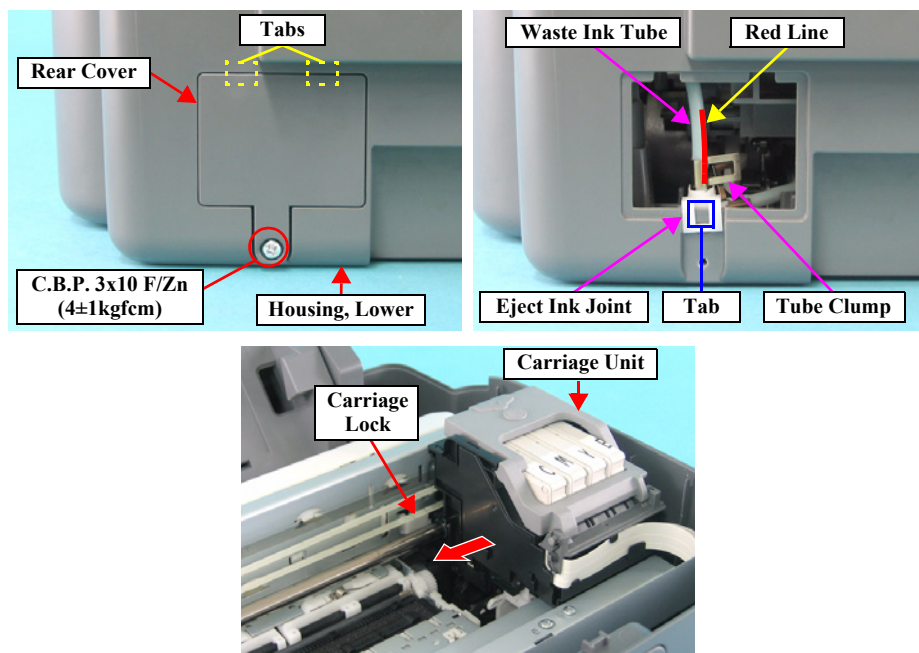
Figure 4-11. Removing Printer Mechanism (1)

☐ **Part/Unit that should be removed before removing Printer Mechanism**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper

☐ **Removal procedure**

1. Remove the screw (x1, ⭕) that secures the Rear Cover, and remove the Rear Cover.

> **CAUTION**
> ⚠
> ■ **The Waste Ink Tube may be broken when it is removed. If it breaks, replace the Ink System Unit.**
> ■ **Ink may leak from the Waste Ink Tube. Prepare cleaning rags beforehand, and be careful not spread ink onto surrounding area.**

> **CHECK POINT**
> ✓
> When removing the Waste Ink Tube, insert a plastic tweezers or a similar tool between the rib of the Eject Ink Joint and the Waste Ink Tube, and pick up the Waste Ink Tube.

2. Remove the Eject Ink Joint from the Housing, Lower, grasp the handle of the Tube Clamp and slide it upwards, and carefully remove the Waste Ink Tube (of the Ink System Unit side).
3. Release the Carriage Lock with a flathead screwdriver, and move the Carriage Unit to the center of the printer.

☐ **External view (2)**

○ **C.B.P. 3x10 F/Zn (4±1kgfcm)**
○ **C.B.P. 3x8 F/Zn (4±1kgfcm)**
☐ **Tab**
☐ **Holding Positions**

Printer Mechanism
CR Guide Frame

Front Paper Guide Support
Guide Pin
PG Lever
Groove

Main Board
CN1
PS Connector Cable
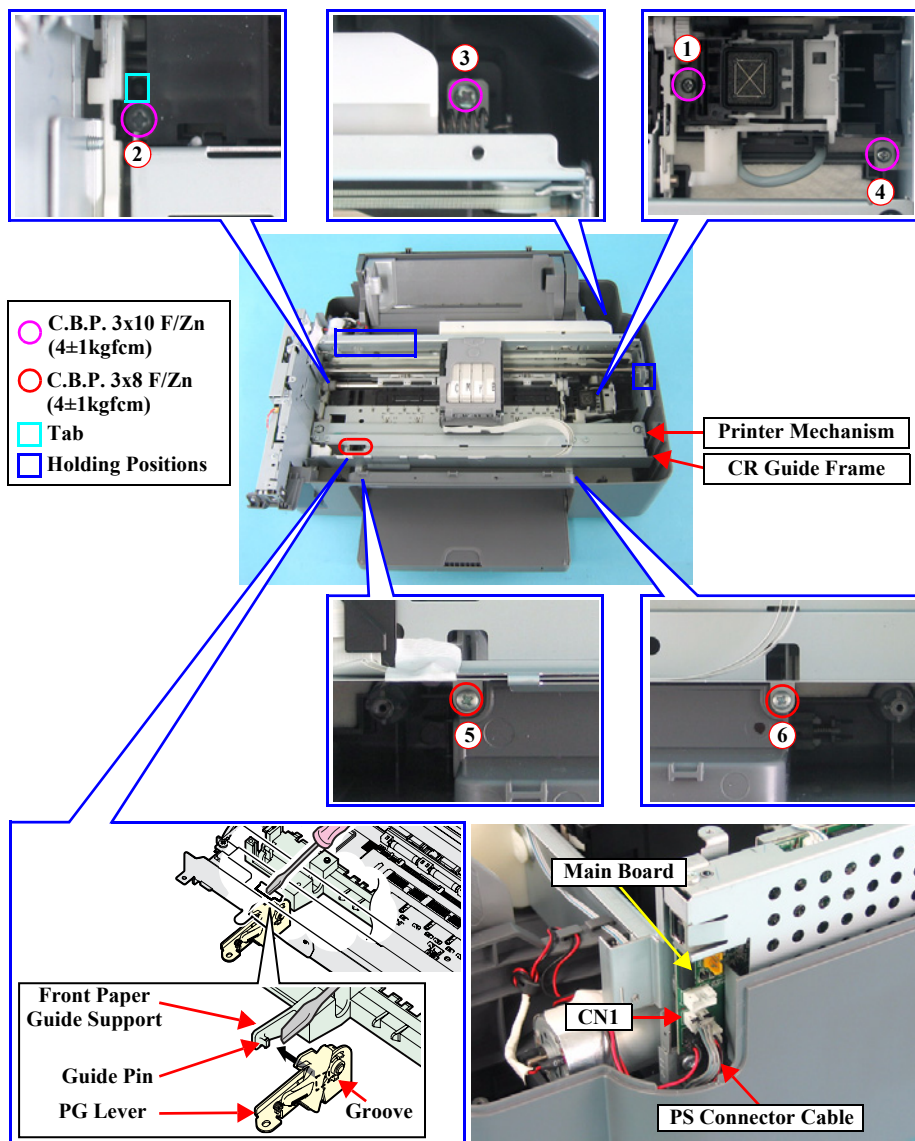
Figure 4-12. Removing Printer Mechanism (2)

CHECK POINT ✓	Removal procedures of the model with no card slot (Stylus CX4100/CX4200/DX4200) differs from the one of the card slot model (Stylus CX4700/CX4800/DX4800). When disassembling the model with no card slot, refer to **"4.6.1 Printer Mechanism (p167)"**.

4.   Remove the screws (x6, ○○) that secure the Printer Mechanism.
5.   Disconnect the PS Connector Cable from the connector (CN1) of the Main Board.

CAUTION !	Hold the designated position and lift Printer Mechanism upward when performing the following step in order to prevent warping of Main Frame.

6.   Hold up the left side of the Printer Mechanism while releasing the guide pin of the Front Paper Guide Support from the groove of the PG Lever with a precision screwdriver (-), and remove whole Printer Mechanism from the Housing, Lower.

WARNING

When installing the Printer Mechanism to the Housing, Lower, insert the Waste Ink Tube to the Eject Ink Joint and securely fasten the Waste Ink Tube with the Tube Clamp, or ink may leak from the Tube.

REASSEMBLY

- When installing the Printer Mechanism to the Housing, Lower, match the guide pin (x1, ▢) of the Housing, Lower with the positioning hole (x1) of the Printer Mechanism.
- Tighten the screws in the order as shown in the figure.
- When installing the Eject Ink Joint to the Housing, Lower, match the tab (x1, ▢) of the Eject Ink Joint with the positioning hole (x1) of the Housing, Lower.
- When installing the Waste Ink Tube to the Eject Ink Joint, install them so that the handle of the Tube Clamp and the red line of the Waste Ink Tube are on the right side.
- When installing the Rear Cover, match the tabs (x2, ▢▢) of the Rear Cover with the notches (x2) of the Housing, Lower.

REASSEMBLY

The assembled accuracy of each part composed of Printer mechanism is based on Housing Lower.
To ensure the assembled accuracy, you have to control the assembled standard position of main frame against X/Y/Z-axis direction as the following figure.

- **[X-axis direction]**
  Confirm that Printer Mechanism is properly placed in the channel of Housing Lower and that there is no gap.
- **[Y-axis direction]**
  Confirm that Printer Mechanism is properly placed in the channel of Housing Lower and that there is no gap.
- **[Z-axis direction]**
  Align the positioning hole (x1) of Printer Mechanism with the guide pin (x1) of Housing Lower, and confirm that there is no gap.

▢	X axis: 4 points
▢	Y axis: 1 point
▢	Z axis: 1 point
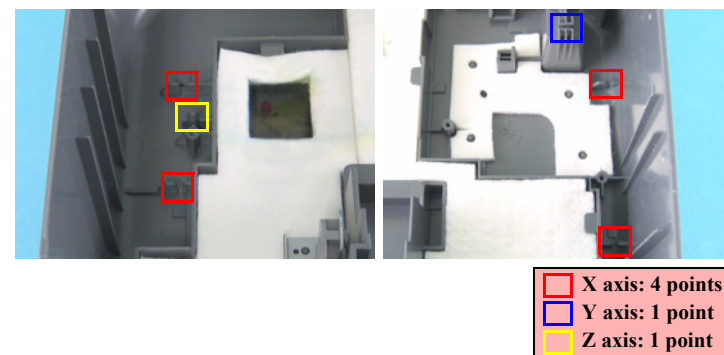
Figure 4-13. Assembled Standard Position of Main Unit

ADJUSTMENT REQUIRED

After replacing/removing the Printer Mechanism, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")

1. "Initialize PF Deterioration Offset"
2. "Disenable PF Deterioration Offset"
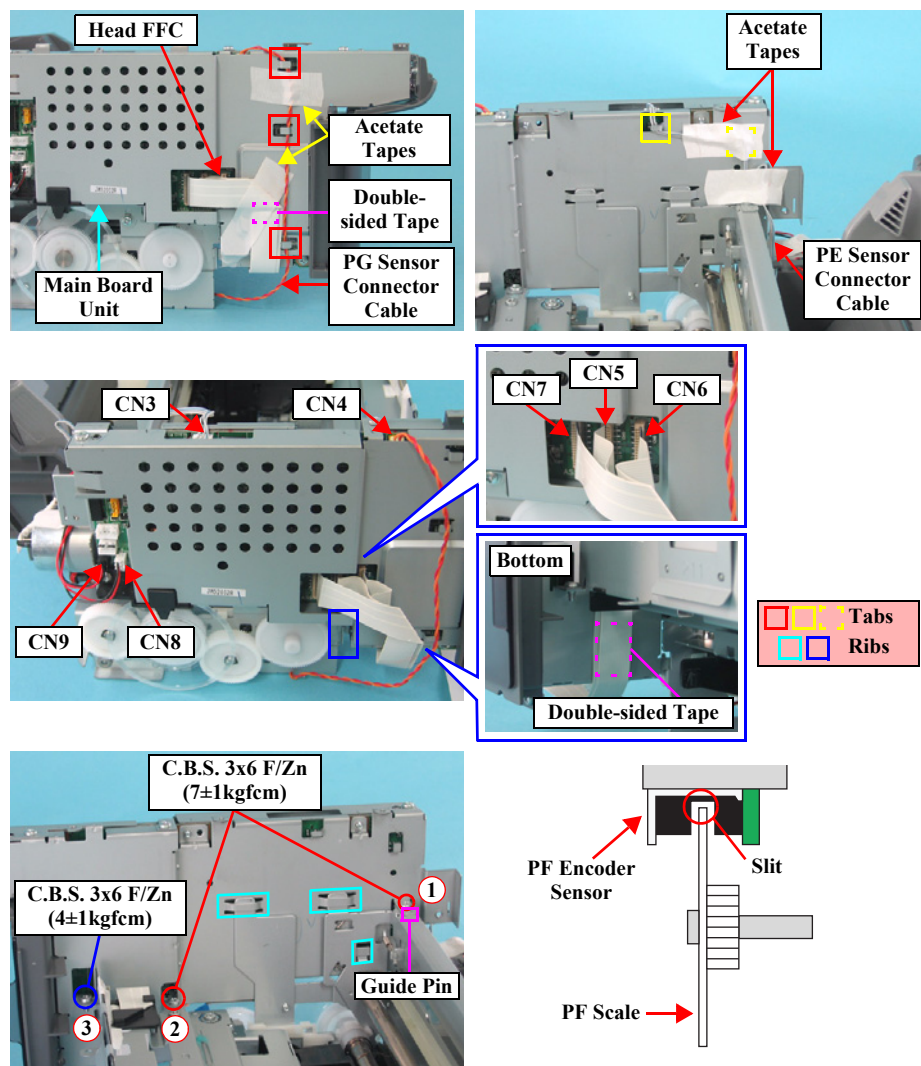3. "CR Offset"

4.4.9 PS Board Unit

☐ **External view**

Figure 4-14. Removing PS Board Unit

☐ **Part/Unit that should be removed before removing PS Board Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Printer Mechanism

☐ **Removal procedure**

1. Peel off the acetate tapes (x2) that secure the PS Connector Cable.
2. Remove the screw (x1, ◯) that secures the PS Board Unit, and remove the PS Board Unit.

REASSEMBLY ↺	▪ **Place the Ferrite Core to the dent of the Housing, Lower.**
	▪ **Route the PS Connector Cable between the ribs of the Housing, Lower, and secure them with acetate tape.**
	▪ **When routing the PS Connector Cable between the ribs of the Housing, Lower, pay attention to the following instructions.**
	  • **The gap between the PS Connector Cable and the Edge of the Housing. Lower should be 15 mm.**
	  • **The PS Connector Cable should be run off the edge of the Housing, Lower for 40 ± 2 mm.**
	  • **The blue line of the PS Connector Cable should be facing rear of the Housing, Lower.**
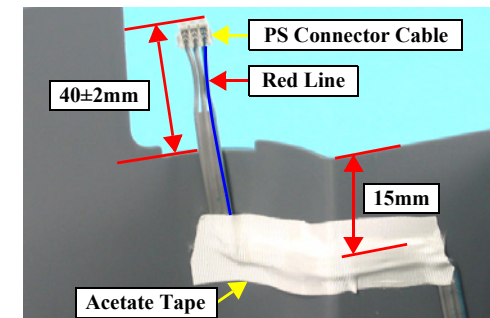
Figure 4-15. Routing PS Connector Cable

ADJUSTMENT REQUIRED 🔧	After replacing/removing the PS Board Unit, perform the following adjustment. (Refer to Chapter 5 "ADJUSTMENT") ▪ **"CR Offset"**

4.4.10 Waste Ink Pads/Stacker Lock/PG Lever/Rubber Feet

☐ **External view (1)**
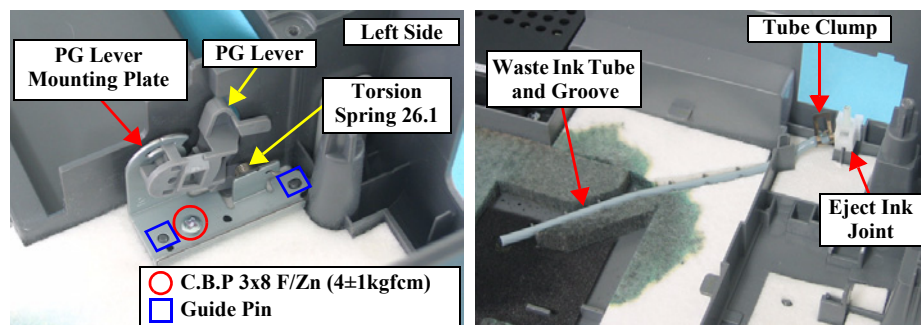
Figure 4-16. Removing Waste Ink Pads

☐ **Part/Unit that should be removed before removing Waste Ink Pads/ Stacker Lock/PG Lever/Rubber Feet**

Document Cover / Paper Support Assy. / Stacker / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism

☐ **Removal procedure**

■ Waste Ink Pads Removal

1. Remove the screw (x1, ⭕) that secures the PG Lever Mounting Plate, and remove the PG Lever, PG Lever Mounting Plate and Torsion Spring 26.1 all together from the Housing, Lower.

> **CHECK POINT** ✔
>
> When disassembling the model with no card slot (Stylus CX4100/ CX4200/DX4200), refer to **"4.6.2 Waste Ink Pads (p169)"**.

2. Remove the Waste Ink Tube along with the Tube Clamp and the Eject Ink Joint from the groove of the Housing Lower.
3. Remove 11 pieces of the Waste Ink Pads from the Housing, Lower.

■ **When installing the Waste Ink Pads, be sure to follow the steps below.**

Step 1
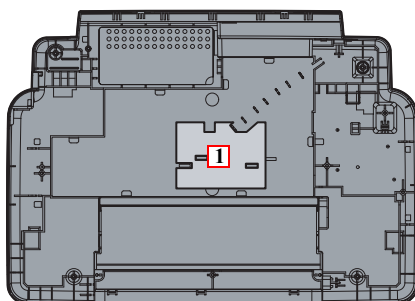
Step 2
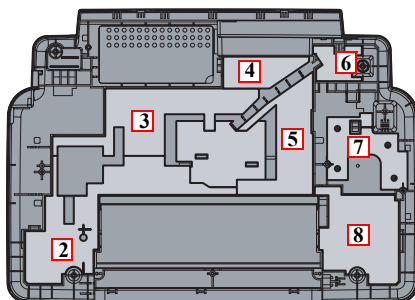
Step 3
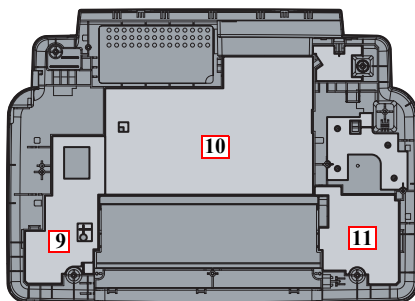
Figure 4-17. Installing Waste Ink Pads

■ **When installing the Waste Ink Tube to the Housing, Lower, insert the Waste Ink Tube to both the groove of the Housing, Lower and the Eject Ink Joint and securely fasten the Waste Ink Tube with the Tube Clamp, or ink may leak from the Tube.**

■ **When installing the PG Lever Mounting Plate to the Housing, Lower, match the guide pins (x2, ☐) of the Housing, Lower with the positioning holes (x2) of the PG Lever Mounting Plate.**

After replacing the Waste Ink Pads, perform the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")

■ **"Waste Ink Pad Counter"**

☐ **External view (2)**
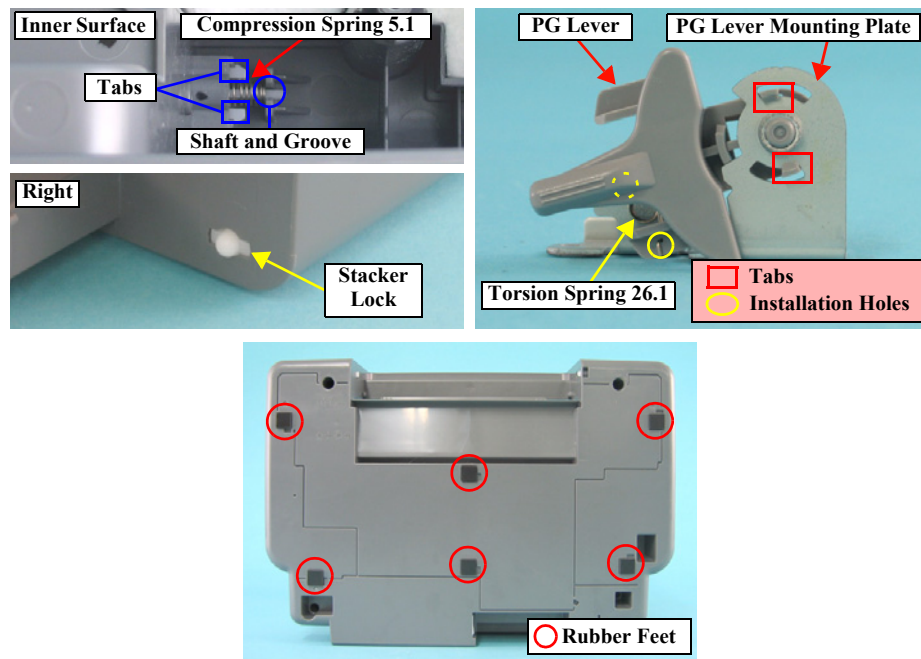
Figure 4-18. Removing Stacker Lock/PG Lever/Rubber Feet

■ Stacker Lock Removal

1. Remove the tabs (x2, ☐) that secure the Stacker Lock, and remove the Stacker Lock and Compression Spring 5.1 from the Housing, Lower.

REASSEMBLY	**Pass the shaft of the Stacker Lock through the groove of the Housing Lower.**

■ PG Lever Removal

1. Release the tabs (x2, ☐) that secure the PG Lever to the PG Lever Mounting Plate.

2. Remove Torsion Spring 26.1 from the installation holes (x2, ○) of the PG Lever and the PG Lever Mounting Plate, and remove the PG Lever.

■ Rubber Feet Removal

REASSEMBLY	**The number of the rubber feet of the model with no card slot (Stylus CX4100/CX4200/DX4200) differs from the ones of the card slot model (Stylus CX4700/CX4800/DX4850).**

1. Remove the rubber feet (x6) from the Housing, Lower.

4.4.11 Main Board Unit/Card Slot Unit

□ **External view (1)**

Figure 4-19. Removing Main Board Unit (1)

□ **Part/Unit that should be removed before removing Main Board Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism

□ **Removal procedure**

■ Main Board Removal

1. Peel off the acetate tape (x1) that secures the Head FFCs (x3).
2. Peel off the acetate tape (x1) that secures the PG Sensor Connector Cable.
3. Release the PG Sensor Connector Cable from the tabs (x3, ▢) of the Main Board Unit.
4. Peel off the acetate tapes (x2) that secure the PE Sensor Connector Cable, and release the PE Sensor Connector Cable from the tabs (x2, ▢) of the Main Board Unit.
5. Disconnect the following connector cables and FFCs from the connectors of the Main Board.
   • CN3: PE Sensor Connector Cable
   • CN4: PG Sensor Connector Cable
   • CN5: Head FFC
   • CN6: Head FFC
   • CN7: Head FFC
   • CN8: CR Motor Connector Cable
   • CN9: PF Motor Connector Cable

6. Remove the screws (x3, ○○) that secure the Main Board Unit, and remove the Main Board Unit from the Printer Mechanism.

REASSEMBLY

■ **Insert the PF Scale into the slit of the PF Encoder Sensor.**
■ **Insert the ribs (x3, ▢) of the Main Frame into the tabs (x3) of the Main Board Unit.**
■ **Insert the rib (x1, ▢) of the Main Board Unit into the tab (x1) of the Main Frame.**
■ **Match the positioning hole (x1) of the Main Board Unit with the guide pin (x1, ▢) of the Main Frame.**
■ **Tighten the screws in the order as shown in the figure.**

❑ **External view (2)**
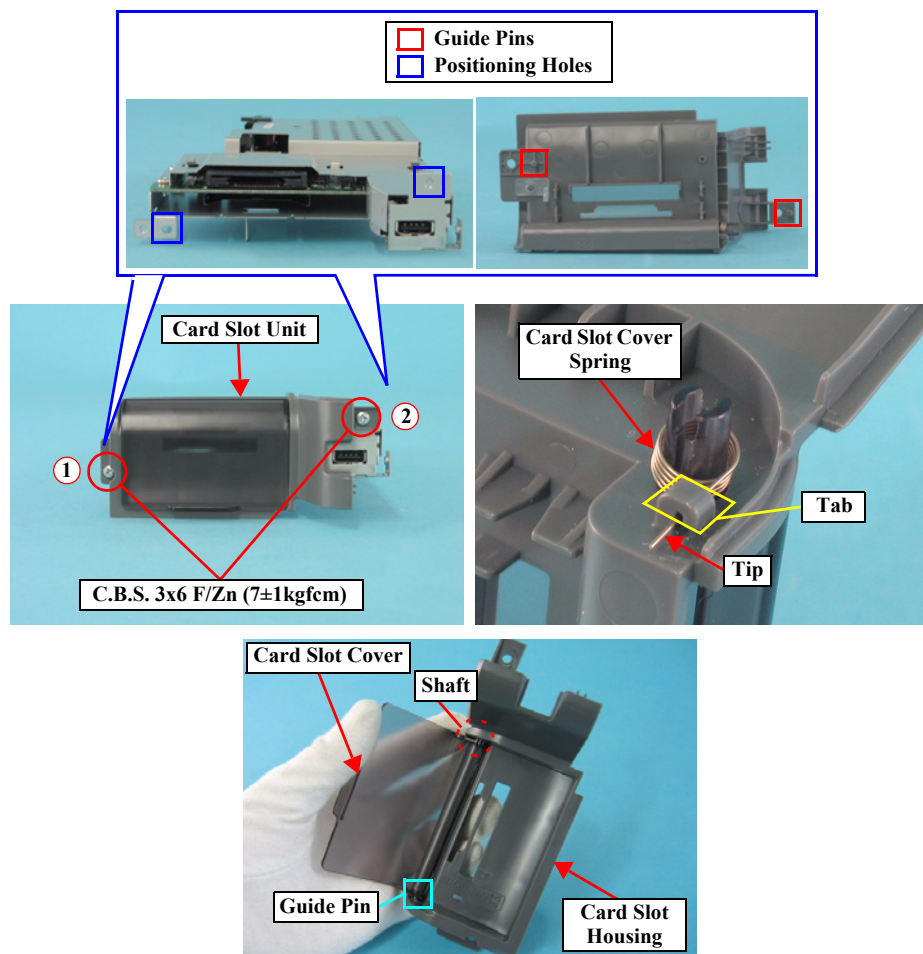
Figure 4-20. Removing Main Board Unit (2)

■ **Card Slot Unit Removal (Only for Stylus CX4700/CX4800/DX4800)**

1. Remove the screws (x2, ⭕) that secure the Card Slot Unit, and remove the Card Slot Unit from the Main Board Unit.

2. Release the tip of the Card Slot Spring from the tab (x1, 🟨) of the Card Slot Housing, and remove the Card Slot Spring.

3. Release the guide pin (x1, 🟦) of the Card Slot Cover from the Card Slot Housing, and remove the Card Slot Cover.

REASSEMBLY

■ **Set the shaft of Card Slot Cover into the Card Slot Housing and align the guide pin.**

■ **Install the Card Slot Spring as shown below.**
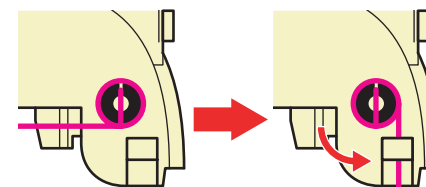
Figure 4-21. Installing Card Slot Spring

■ **Tighten the screws in the order as shown in the figure below.**

■ **Match the guide pins (x2, 🟥) of the Card Slot Housing with the positioning holes (x2, 🟦) of the Main Board Unit.**

REASSEMBLY

■ **PF Scale Sensor positioning adjustment**
Use the following procedure to confirm that the PF Scale is positioned in the center of the PF Encoder Sensor.
1. Test fit the Main Board Unit, and confirm whether or not the PF Scale is positioned in the center of PF Encoder Sensor.
2. If the PF Scale is positioned in the center of the PF Encoder Sensor, adjustment is complete. If scale is not positioned in center of sensor, adjust position of the PF Scale using spacer (0.5mm thickness) as shown in the figure below.

Left Side   Right Side
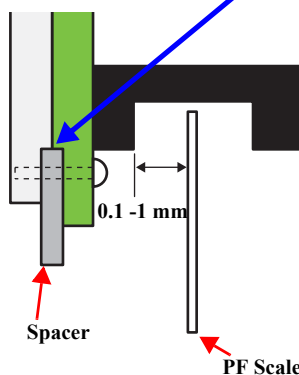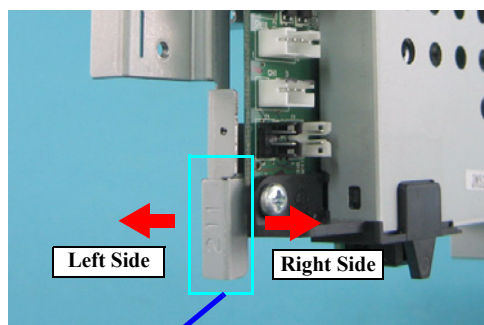
Spacer is not applied to the Main Board Unit for service part.
■ **Place spacer between Shield Board and Main Board.**
■ **If PF Scale is off to the left, remove the spacer.**
■ **If PF Scale is off to the right, add an additional spacer. (Total of 2 spacers)**

0.1 -1 mm

Spacer

PF Scale

Figure 4-22. PF Scale Sensor Positioning Adjustment

ADJUSTMENT REQUIRED

After removing/replacing the Main Board Unit, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")
■ **[When it is possible to read data from the old board]**
1. **"EEPROM Data Copy"**
2. **"PF Scale Sensor Positioning Adjustment"**
■ **[When it is impossible to read from the old board]**
1. **"PF Scale Sensor Positioning Adjustment"**
2. **"Market Setting"**
3. **"Head ID Input"**
4. **"Top Margin Adjustment"**
5. **"Head Angular Adjustment"**
6. **"Bi-D adjustment"**
7. **"PW Sensor Adjustment"**
8. **"First Dot Adjustment"**
9. **"CR Offset"**

4.4.12 ASF Unit

☐ **External view (1)**

☐ **Part/Unit that should be removed before removing ASF Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism

☐ **Removal procedure**

1. Peel off the acetate tape (x1) that secures the PE Sensor Connector Cable to the shield plate of the Main Board, and release PE Sensor Connector Cable from the tabs (x3, ☐) of the ASF Unit and the Main Board Unit.
2. Release the CR Motor Connector Cable from the tab (x1, ☐) of the ASF Unit.
3. Remove the Ferrite Core of the PF Motor Connector Cable from the slot of the ASF Unit.
4. Remove the screws (x5, ⭕⭕⭕) that secure the ASF Unit, and remove the ASF Unit from the Printer Mechanism.

REASSEMBLY
- Match the guide pin (x1, ☐) and the rib (x1, ☐) of the ASF Unit with the positioning holes (x2) of the Main Frame.
- Insert the shaft of the ASF Unit into the slot of the Ink System Unit.
- Tighten the screws in the order as shown in the figure.

Figure 4-23. Removing ASF Unit (1)

□ **External view (2)**
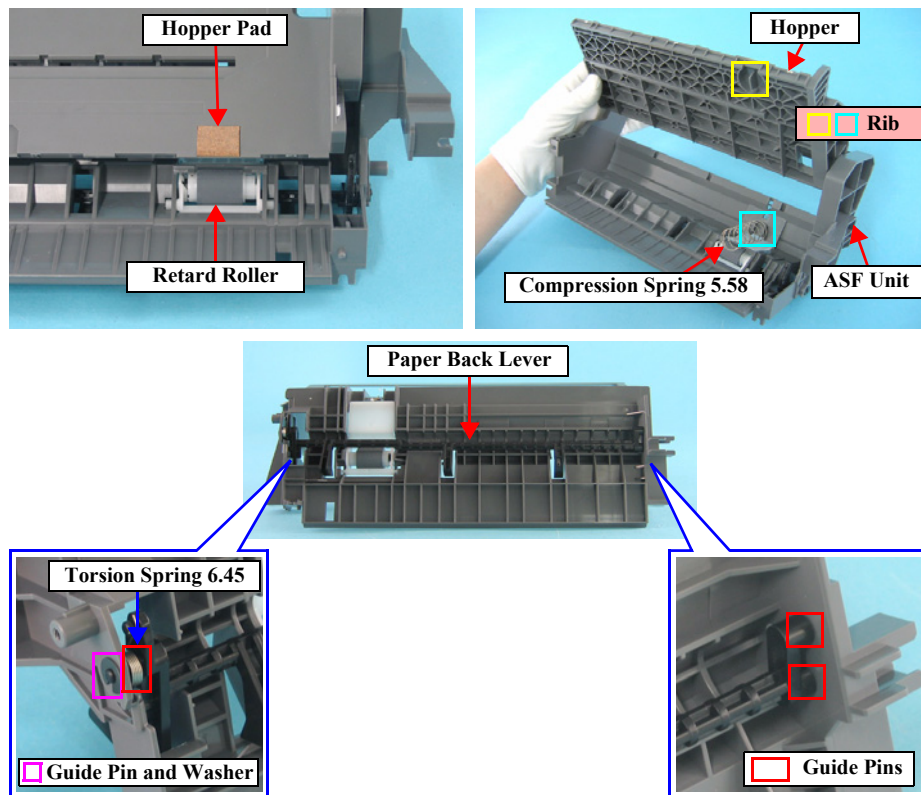
Figure 4-24. Removing ASF Unit (2)

5. Open the Hopper, and remove Compression Spring 5.58.
6. Remove the washer that secures the left shaft of the Paper Back Lever.

CAUTION !	Do not touch the Retard Roller and the Hopper Pad.

7. Bend the Paper Back Lever, release the guide pins (2 each, ▭) on both ends from the ASF Unit, and remove the Paper Back Lever and Torsion Spring 6.45.

REASSEMBLY	■ **When installing Torsion Spring 6.45, hitch the L-shape tip of Torsion Spring 6.45 to the shaft of the Paper Back Lever, and hitch the short tip to the groove of the ASF Unit.**
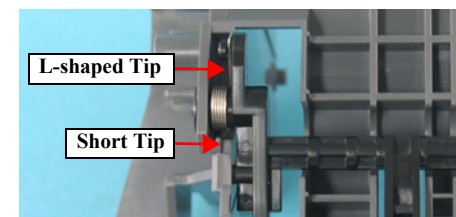
Figure 4-25. Installing Torsion Spring 6.45

■ **Compression Spring 5.58 should be hitched to the rib (x2, ▭) of the ASF Frame and the rib (x1, ▭) of the Hopper.**

ADJUSTMENT REQUIRED	■ After replacing the ASF Unit with a new one, always apply grease G-26 and grease G-46 to the specified positions. • See **Figure 6-6 *(p191)*** for details. ■ After removing/replacing the ASF Unit, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT") 1. **"Top Margin Adjustment"** 2. **"First Dot Adjustment"**

4.4.13 Holder Shaft Unit

☐ **External view**
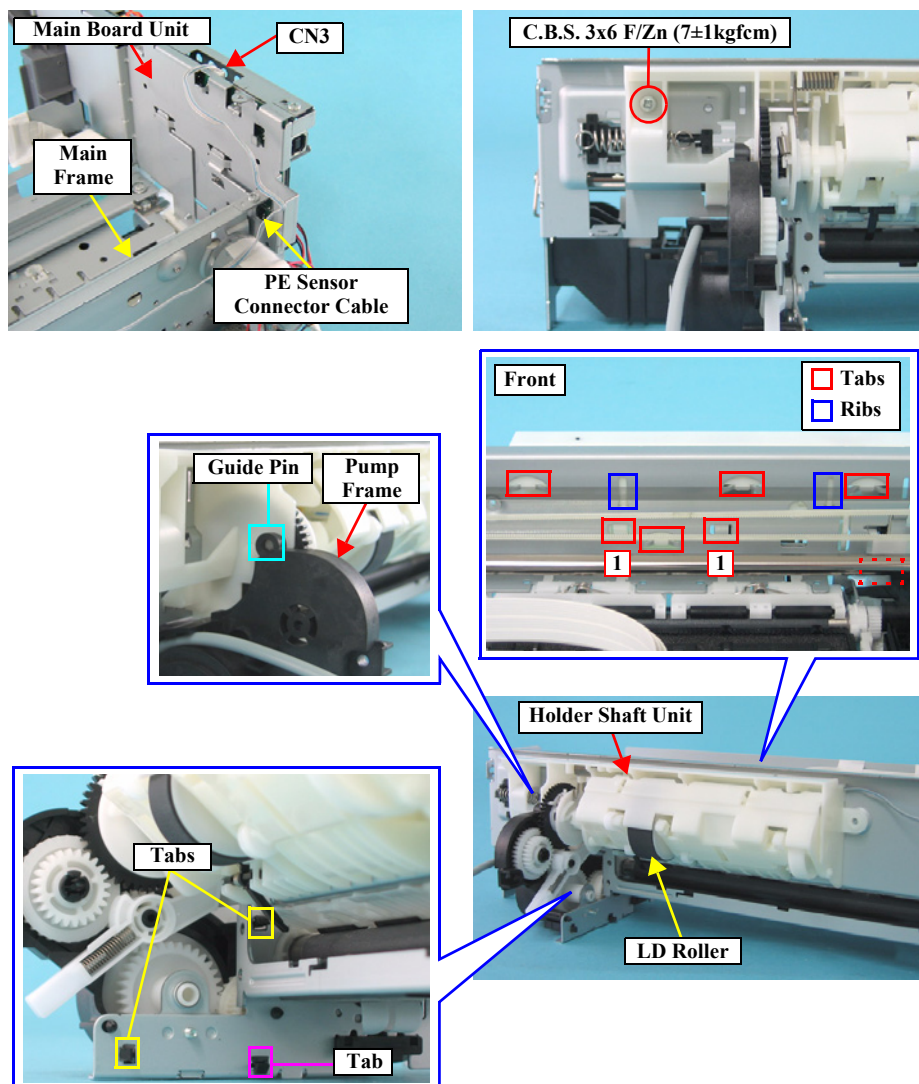
Figure 4-26. Removing Holder Shaft Unit

☐ **Part/Unit that should be removed before removing Holder Shaft Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Printer Mechanism / ASF Unit

☐ **Removal procedure**

1. Slide the Carriage Unit to the center of the printer.
2. Disconnect the PE Sensor Connector Cable from the connector (CN3) of the Main Board.
3. Remove the screw (x1, ⭕) that secures the Holder Shaft Unit.

> **CAUTION** ❗
> - **Do not open the Pump Frame too wide. Doing so may break the tab (x1, ▢) on the downside of the Pump Frame.**
> - **Never touch the LD Roller.**

4. When removing the Holder Shaft Unit from the Main Frame, follow the steps described below.
   1. Release the tabs (x2, ▢) that secure the Pump Frame to the Main Frame.
   2. Move the Pump Frame to the home position, and release the guide pin (x1, ▢) of the Holder Shaft Unit.
   3. Push the tabs (x2, 1) of the Holder Shaft Unit, and remove the Holder Shaft Unit upward.

> **REASSEMBLY**
> - **Match the guide pin (x1, ▢) of the Holder Shaft Unit with the positioning hole (x1) of the Pump Frame.**
> - **Secure the Holder Shaft Unit with the tabs (x6, ▢) and the ribs (x2, ▢).**

> **ADJUSTMENT REQUIRED**
> **After removing/replacing the Holder Shaft Unit, perform the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")**
> - **"Top Margin Adjustment"**

4.4.14 Spur Gear 36.8/Extension Spring 0.143/Clutch

☐ **External view**
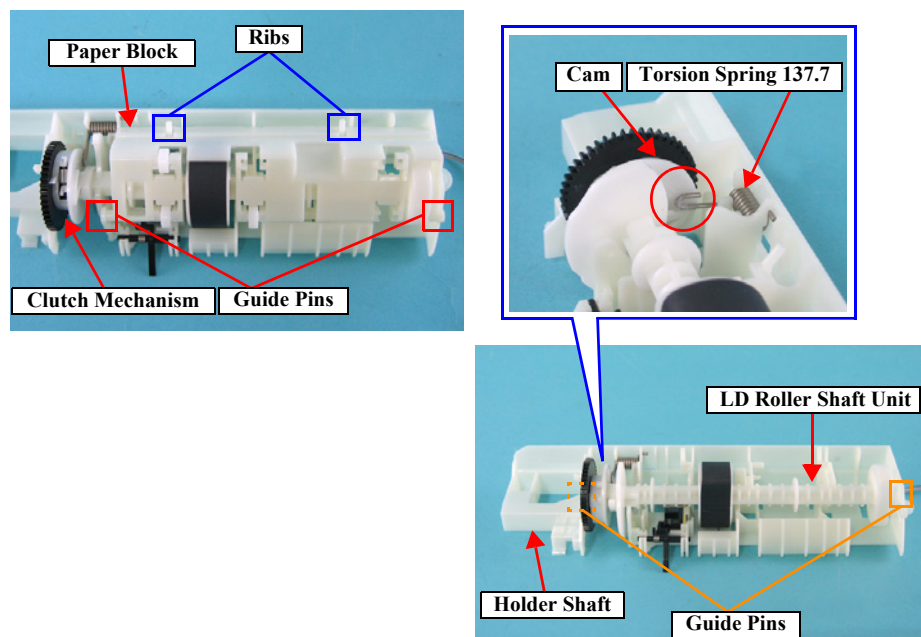
Figure 4-27. Removing Spur Gear 36.8/Extension Spring 0.143/Clutch

☐ **Part/Unit that should be removed before removing Spur Gear 36.8/ Extension Spring 0.143/Clutch**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism / ASF Unit / Holder Shaft Unit

☐ **Removal procedure**

1. Release the guide pins (x2, ▢) that secure the Paper Block to the Holder Shaft, and remove the Paper Block.
2. Remove the LD Roller Shaft together with the Clutch Mechanism from the Holder Shaft.
3. Remove the Spur Gear 36.8 from the LD Roller Shaft.
4. Remove the Extension Spring 0.143, and remove the Clutch from the LD Roller Shaft.

REASSEMBLY

■ **Assemble the LD Roller Shaft Unit as shown below.**
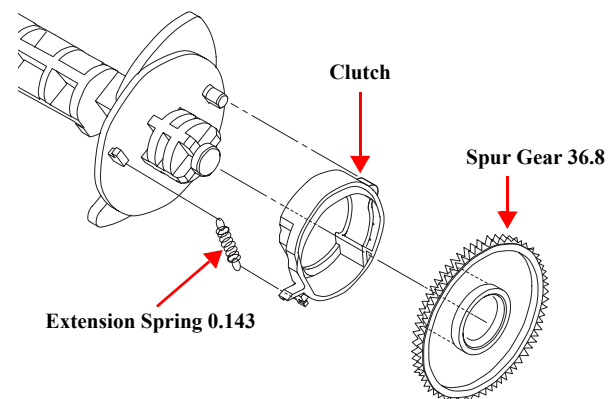
Figure 4-28. Assembling LD Roller Shaft Unit

■ Match the guide pins (x2, ▢⋮▢) of the LD Roller Shaft with the positioning holes of the Holder Shaft.
■ Hold down the Cam of the LD Roller Shaft with the tip of the Torsion Spring 137.7.
■ Match the ribs (x2, ▢) of the Holder Shaft with the notches (x2) of the Paper Block.

4.4.15 PE Sensor Board/PE Sensor Lever

□ **External view**
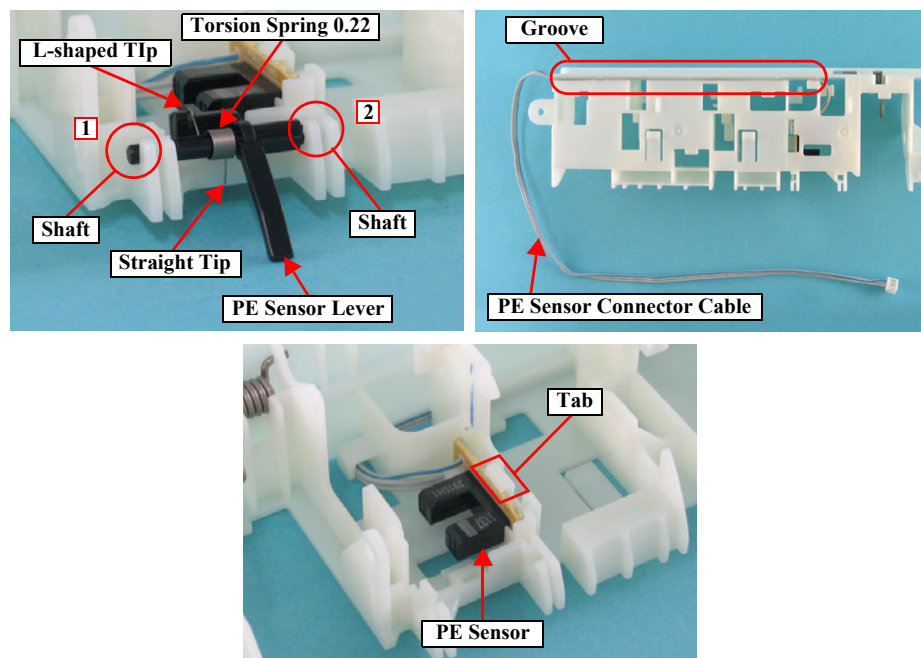
Figure 4-29. Removing PE Sensor Board/PE Sensor Lever

□ **Part/Unit that should be removed before removing PE Sensor Board/ PE Sensor Lever**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism / ASF Unit / Holder Shaft Unit / Spur Gear 36.8 / Extension Spring 0.143 / Clutch

□ **Removal procedure**

1. Remove the shaft of the PE Sensor Lever from the Holder Shaft, and remove the PE Sensor Lever and Torsion Spring 0.22 in the order as shown in the figure.

2. Remove Torsion Spring 0.22 from the PE Sensor Lever.

3. Release the PE Sensor Connector Cable from the groove of the Holder Shaft.

4. Release the tab (x1, □) that secures the PE Sensor, and remove the PE Sensor from the Holder Shaft.

> **REASSEMBLY**
> - **Fasten the L-shaped tip of Torsion Spring 0.22 to the concave portion of the PE Sensor Lever, and fasten the straight tip to the Holder Shaft.**
> - **Route the PE Sensor Connector Cable to the groove of the Holder Shaft so that the Cable does not run off.**

4.4.16 CR Guide Frame

☐ **External view**
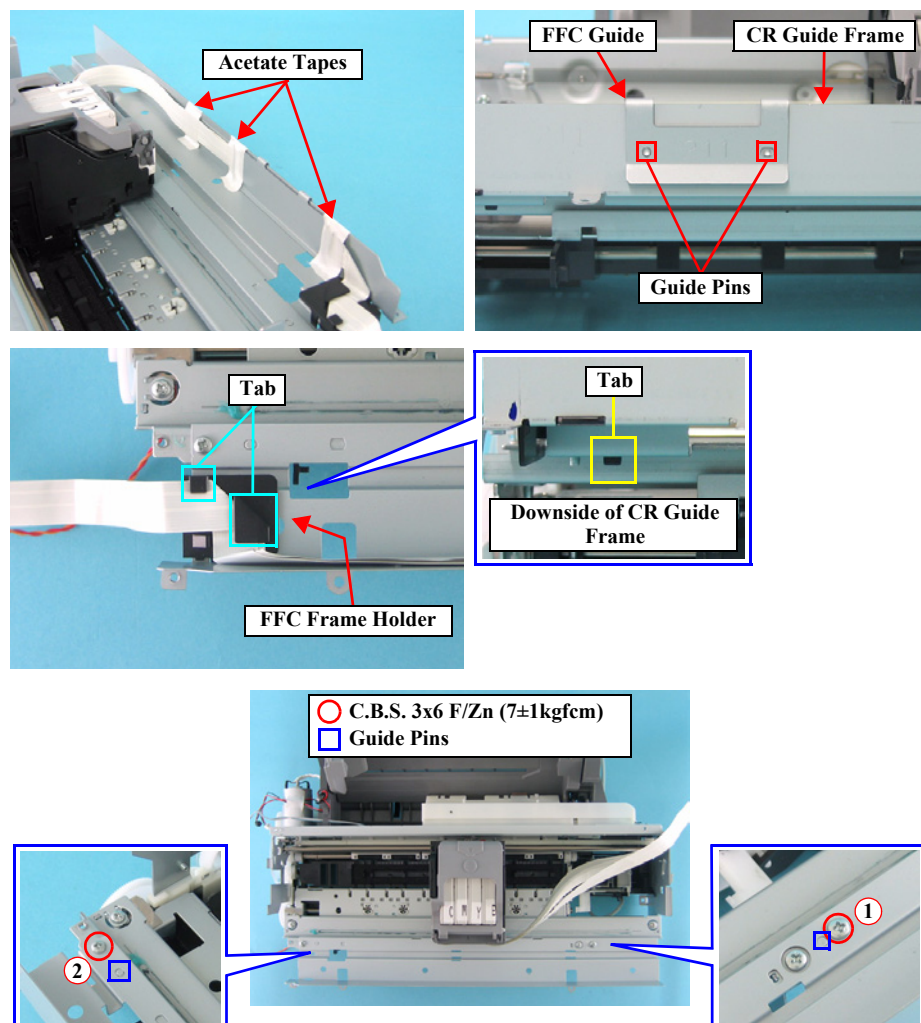
Figure 4-30. Removing CR Guide Frame

☐ **Part/Unit that should be removed before removing CR Guide Frame**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism / Main Board Unit

☐ **Removal procedure**

1. Peel off the acetate tape (x3) that secure the Head FFCs (x3).
2. Release the guide pins (x2, ▭) that secure the FFC Guide, and remove the FFC Guide from the CR Guide Frame.
3. Release the tab (x1, ▭) on the bottom of the CR Guide Frame that secures the FFC Frame Holder, and remove the FFC Frame Holder together with the Head FFC.
4. Release the Head FFC from the tabs (x2, ▭) of the FFC Frame Holder.
5. Release the Head FFCs (x3) secured with the double-sided tape (x1) from the CR Guide Frame.
6. Remove the screws (x2, ◯) that secure the CR Guide Frame, and remove the CR Guide Frame from the Printer Mechanism.

REASSEMBLY

- ■ **Match the guide pins (x2, ▭) of the Front Frame with the positioning holes (x2) of the CR Guide Frame.**
- ■ **Tighten the screws in the order as shown in the figure.**
- ■ **Attach the Head FFCs (x3) with double-sided tape to the position on the CR Guide Frame indicated with printed lines.**
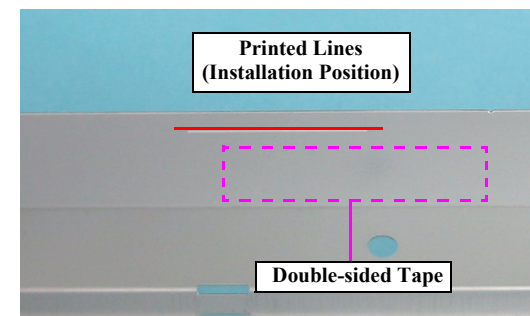
Figure 4-31. Attaching Head FFCs
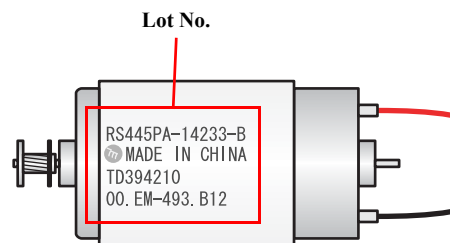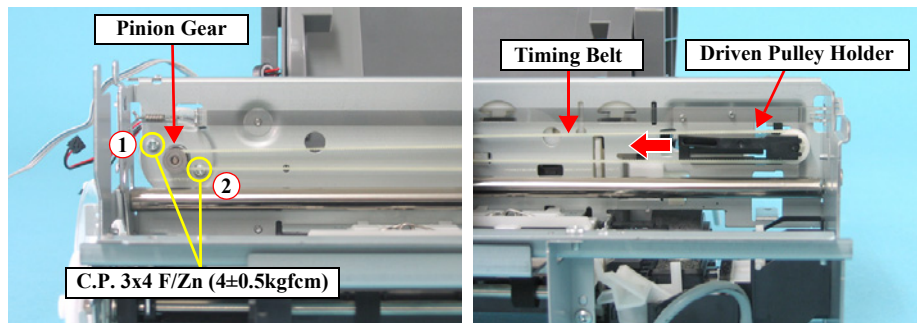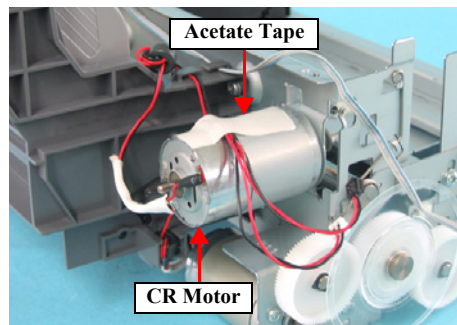
4.4.17 CR Motor

☐ **External view**

Figure 4-32. Removing CR Motor

☐ **Part/Unit that should be removed before removing CR Motor**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism / Main Board Unit / CR Guide Frame
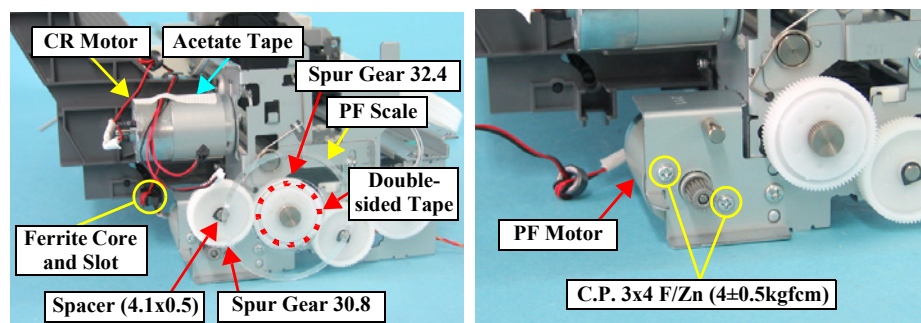
☐ **Removal procedure**

1. Slide the Carriage Unit to the center of the printer.
2. Peel off the acetate tape (x1) from the CR Motor, and release the CR Motor Connector Cable and the PF Motor Connector Cable.
3. Release the CR Motor Connector Cable from the tab of the ASF Unit.
4. Loosen the tension of the Timing Belt by pressing the Driven Pulley Holder in the direction of the arrow as shown in the figure, and remove the Timing Belt from the pinion gear of the CR Motor.

CAUTION !	Do not damage the pinion gear of the CR Motor.

5. Remove the screws (x2, ⊙) that secure the CR Motor, and remove CR Motor from the Printer Mechanism.

REASSEMBLY	■ Install the CR Motor so that the Lot Number faces upward. ■ Tighten the screws in the order as shown in the figure. ■ Make sure that there is no gap between the CR Motor and the Main Frame.

ADJUSTMENT REQUIRED	After removing/replacing the CR Motor, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT") 1. "Bi-D adjustment" 2. "PW Sensor Adjustment" 3. "First Dot Adjustment" 4. "CR Offset" (only after replacement)

4.4.18 PF Motor

☐ **External view**

Figure 4-33. Removing PF Motor

☐ **Part/Unit that should be removed before removing PF Motor**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism / Main Board Unit

☐ **Removal procedure**

1. Peel off the acetate tape (x1) from the CR Motor, and release the CR Motor Connector Cable and the PF Motor Connector Cable.
2. Remove the Ferrite Core (x1) of the PF Motor Connector Cable from the slot (x1) of ASF Unit.
3. Remove the PF Scale that is secured with double-sided tape to the Spur Gear 32.4.
4. Remove the Spacer (4.1 x 0.5) that secures Spur Gear 30.8, and remove Spur Gear 30.8 from the Main Frame.

> **CAUTION**
>
> **Do not damage the following parts.**
> - **Pinion gear of the PF Motor**
> - **PF Scale**
> - **Spur Gear 30.8**

5. Remove the screws (x2, ◯) that secure the PF Motor, and remove the PF Motor from the Printer Mechanism.

> **REASSEMBLY**
>
> ■ **Install the PF Motor so that the Lot Number faces upward.**
>
>
>
> **Figure 4-34. Installing PF Motor**
>
> ■ **Make sure that there is no gap between the PF Motor and the Main Frame.**

4.4.19 Carriage Unit/CR Encoder Board/PW Sensor Board/Head FFC
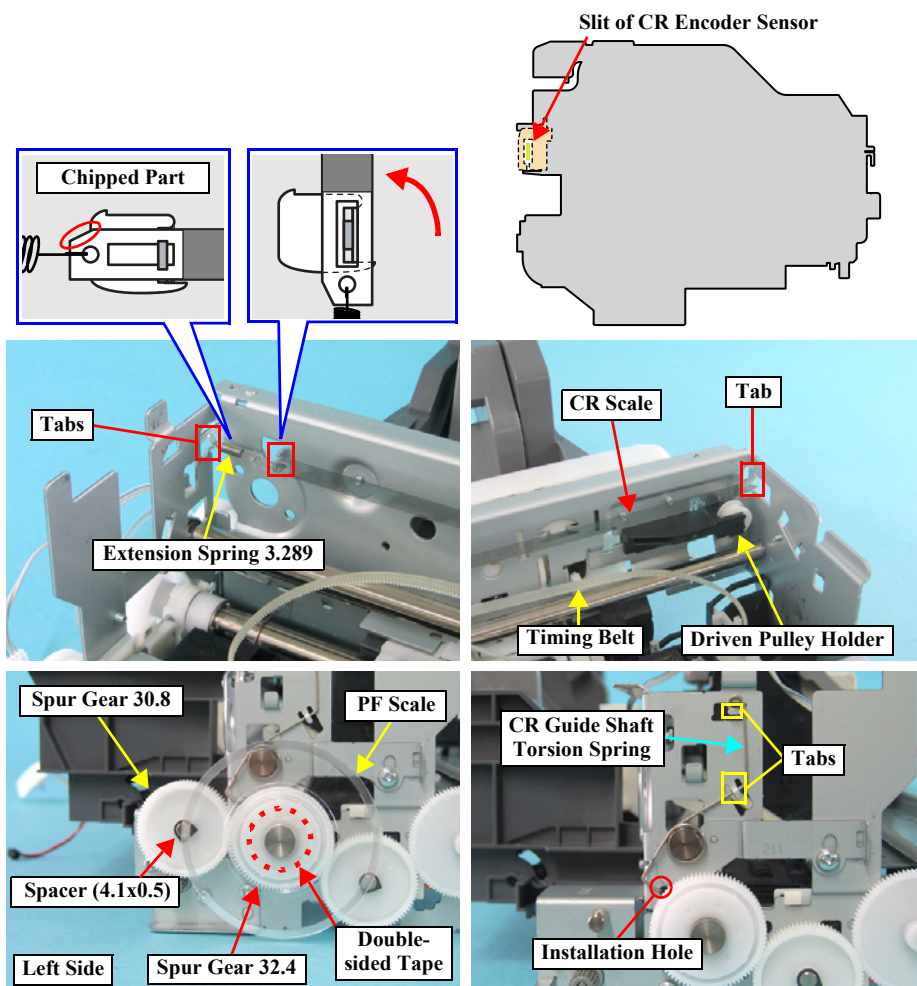
□ **External view (1)**

Figure 4-35. Removing Carriage Unit (1)

□ **Part/Unit that should be removed before removing Carriage Unit/ CR Encoder Board/PW Sensor Board/Head FFC**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Printer Mechanism / Main Board Unit / CR Guide Frame / CR Motor

□ **Removal procedure**

■ Carriage Unit Removal

1. Release Timing Belt from Driven Pulley Holder.

CAUTION ⚠	**Pay attention to the following instructions:** ■ **Do not touch the CR Scale with bare hands.** ■ **Do not damage the CR Scale.** ■ **Handle the Extension Spring 3.289 in a way that does not extend it.**

2. Remove the CR Scale from the Main Frame.

CAUTION ⚠	**Be cautious of the following points.** ■ **Do not touch PF Scale with bare hands.** ■ **Do not damage PF Scale.**

3. Remove the PF Scale that is secured to Spur Gear 32.4 with double-sided tape (x1).
4. Remove Spacer (4.1 x 0.5) that secures Spur Gear 30.8, and remove Spur Gear 30.8 from the Main Frame.
5. Release CR Guide Shaft Torsion Spring from the tabs (x2, □) of the Main Frame, and remove CR Guide Shaft Torsion Spring from the Main Frame.
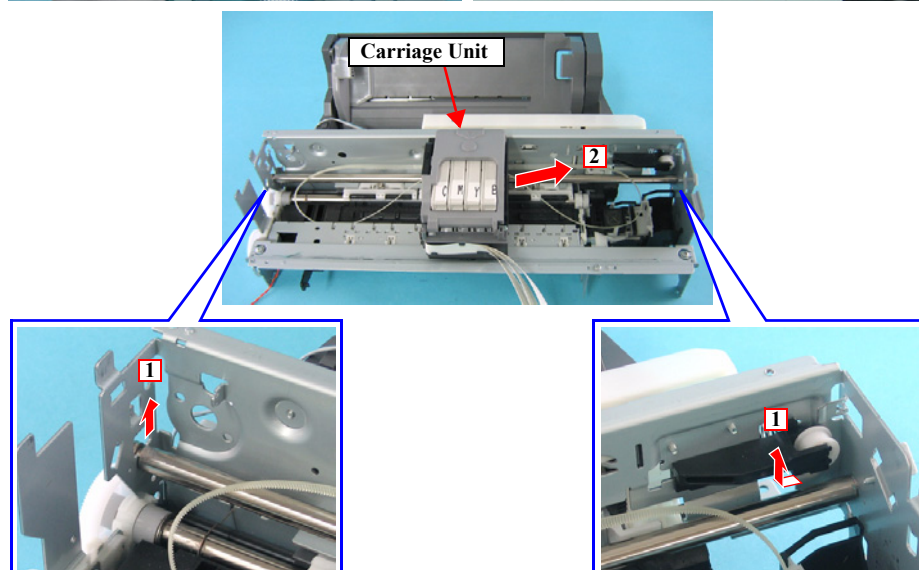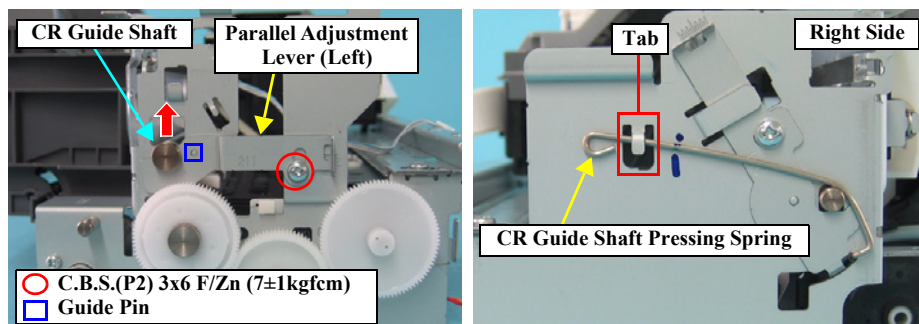
☐ **External view (2)**

Figure 4-36. Removing Carriage Unit (2)

6. Remove the screw (x1, ⬭) that secures the Parallel Adjustment Lever (Left), and remove the Parallel Adjustment Lever (Left) from Main Frame while lifting left end of the Carriage Guide Shaft upward.
7. Release the CR Guide Shaft Pressing Spring from the tab (x1, ▭) of the Main Frame, and remove the CR Guide Shaft Pressing Spring from the Main Frame.
8. Remove the Carriage Unit and the Carriage Guide Shaft from Printer Mechanism as follows.
   1. Lift up the left end of the Carriage Guide Shaft and shift in left direction until releasing right end of the Carriage Guide Shaft from the notch of the Main Frame.
   2. Remove the Carriage Guide Shaft along with the Carriage Unit from the Main Frame.

CAUTION **!**	■ **Do not damage the Carriage Guide Shaft.** ■ **Do not stain the Timing Belt with the grease (KEN Grease).**

9. Pull out the Carriage Guide Shaft from the Carriage Unit.

REASSEMBLY	■ **When installing the Parallel Adjustment Lever to the Main Frame, match the guide pin (x1, ▭) of the Main Frame with the positioning hole (x1) of the Parallel Adjustment Lever (left).** ■ **When installing the CR Scale, pay attention to the following instructions.** 　• **Pass the CR Scale into the slit of the CR Encoder Sensor.** 　• **Chipped portion of the CR Scale should be facing upward.** 　• **Make sure that Extension Spring 3.289 is not twisted, and hitch one side of Extension Spring 3.289 to the hook of the Main Frame.**

❑ **External view (3)**

CR Encoder Board | Connector
Notch
C.B.P. (P1) 1.7x5 F/ZB (2±0.5kgfcm)
PW Sensor Cap
Head FFC
C.P.B. (P1) 1.7x5 F/ZB (2+0.5kgfcm)
Guide Pins

PW Sensor Board
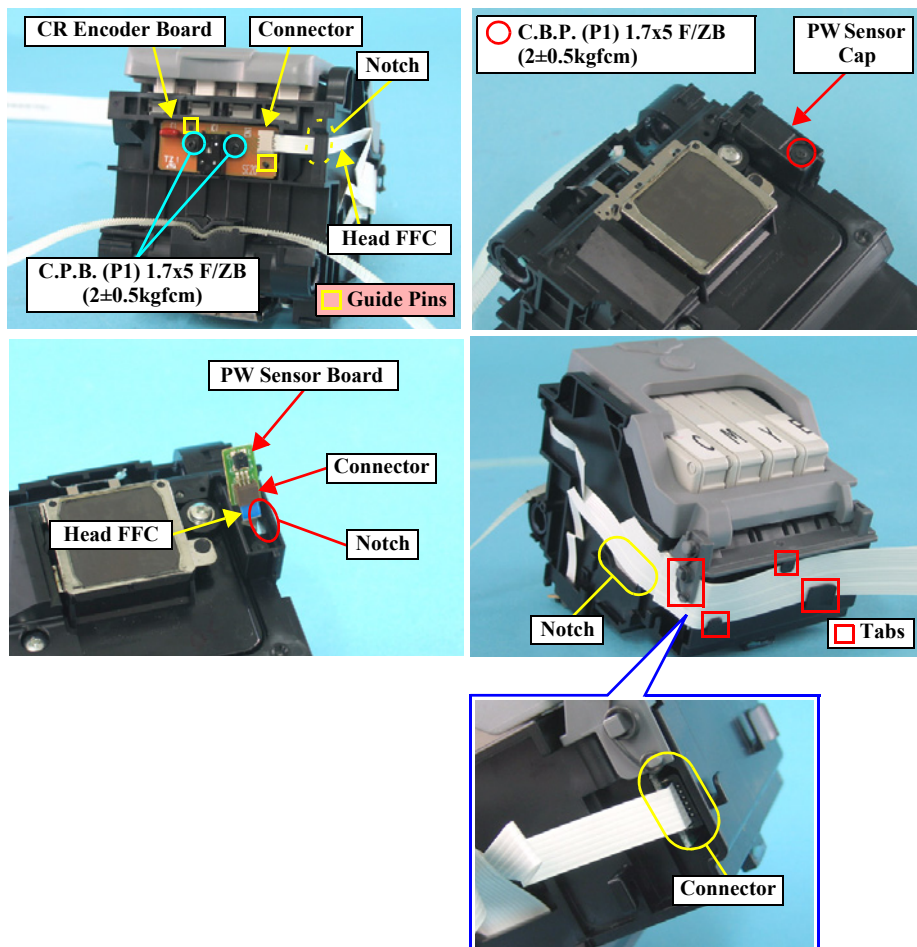Connector
Head FFC
Notch
Notch | Tabs
Connector

Figure 4-37. Removing Carriage Unit (3)

■ CR Encoder Removal

1. Disconnect the Head FFC from the connector of the CR Encoder Board, and pull out the Head FFC from the notch of Carriage.
2. Remove the screws (x2, ⭕) that secure the CR Encoder Board, and remove the CR Encoder Board

REASSEMBLY

Match the guide pins of the Carriage (x2, ▫) with the positioning hole (x2) of the CR Encoder Board.

■ PW Sensor Board Removal

1. Remove the screw (x1, ⭕) that secures the PW Sensor Cap, and remove the PW Sensor Cap.
2. Disconnect the Head FFC from the connector of the PW Sensor Board, pull out the Head FFC from the notch of the Carriage, and remove the PW Sensor Board.

■ Head FFC Removal

1. Remove the Printhead from the Carriage Unit.
2. Pull out the Head FFC from the notch of the Carriage.
3. Release the Head FFC from the tabs (x4, ▫) that secure the Head FFC.
4. Disconnect the Head FFC from the connector of the CSIC board.

ADJUSTMENT REQUIRED

■ **After replacing the Carriage Unit with a new one, always apply grease KEN to the specified parts.**
   • **Refer to Figure 6-7 *(p191)* for details.**
■ **After replacing the Carriage Unit, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")**
   1. **"PG Adjustment"**
   2. **"Top Margin Adjustment"**
   3. **"Head Angular Adjustment"**
   4. **"Bi-D adjustment"**
   5. **"PW Sensor Adjustment"**
   6. **"First Dot Adjustment"**

4.4.20 Paper Guide Upper Unit
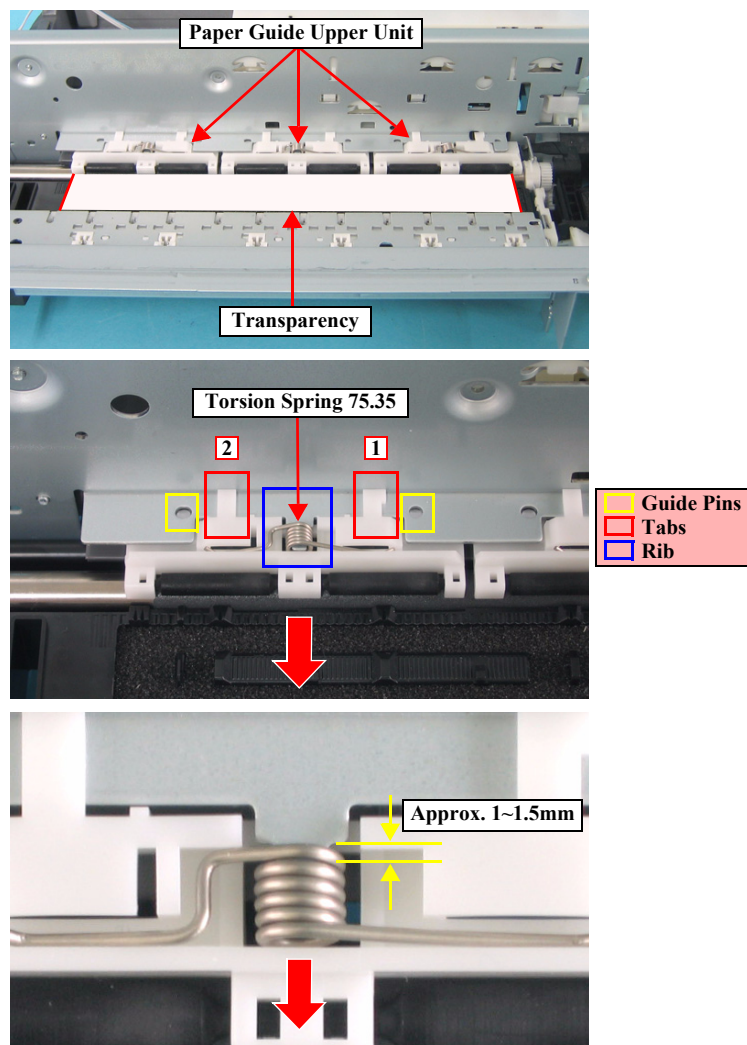
❑ **External view**

Figure 4-38. Removing Paper Guide Upper Unit

❑ **Part/Unit that should be removed before removing Paper Guide Upper Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Printer Mechanism / Main Board Unit / CR Guide Frame / CR Motor / Carriage Unit

❑ **Removal procedure**

1. Set a transparency sheet.
2. Release the guide pins (2 each, ☐) that secure the Paper Guide Upper Unit (x3), and remove the Paper Guide Upper Unit (x3) along with Torsion Spring 75.35 (1 each) from the Main Frame.

Reassembly of the Paper Guide Upper Unit

1. **Set Torsion Spring 75.35 onto the Paper Guide Upper Unit.**
2. **Temporarily place the tabs (x2, ☐) of the Paper Guide Upper Unit onto the Main Frame in order as shown in the figure.**
3. **Insert the coil section of Torsion Spring 75.35 into the rib.**
4. **Align the positioning holes (x2) of the Main Frame with the guide pins (x2, ☐) of the Paper Guide Upper Unit, and set the Paper Guide Upper Unit along with Torsion Spring 75.35.**
5. **Pull the coil section of Torsion Spring 75.35 toward you, hold the margin at approximately 1~1.5 mm, and eliminate the gap with the Paper Guide Upper Unit.**

After removing/replacing the Paper Guide Upper Unit, perform the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")
  ■ **"Top Margin Adjustment"**

4.4.21 Front Frame

☐ **External view**

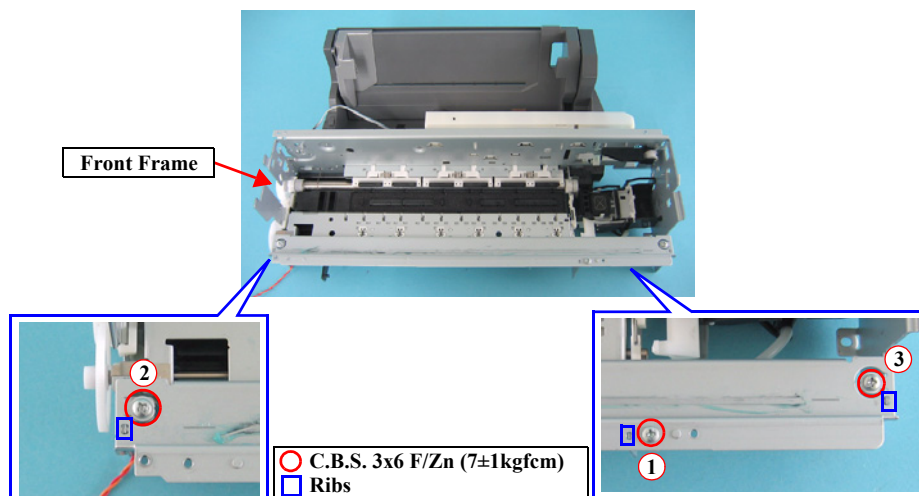Front Frame

☐ C.B.S. 3x6 F/Zn (7±1kgfcm)
☐ Ribs

Figure 4-39. Removing Front Frame

☐ **Part/Unit that should be removed before removing Front Frame**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head / Printer Mechanism / Main Board Unit / CR Guide Frame / CR Motor / Carriage Unit

☐ **Removal procedure**

1. Remove the screws (x3, ◯) that secure the Front Frame, and remove the Front Frame from the Printer Mechanism.

REASSEMBLY

- **Match the ribs (x3, ☐) of the Main Frame with the positioning holes of the Front Frame.**
- **Tighten the screws in the order as shown in the figure.**

ADJUSTMENT REQUIRED

- **After replacing the Front Frame with a new one, always apply grease KEN to the specified parts.**
  - **Refer to Figure 6-10 *(p192)* for details.**
- **After removing/replacing the Front Frame, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")**
  1. **"Bi-D adjustment"**
  2. **"First Dot Adjustment"**
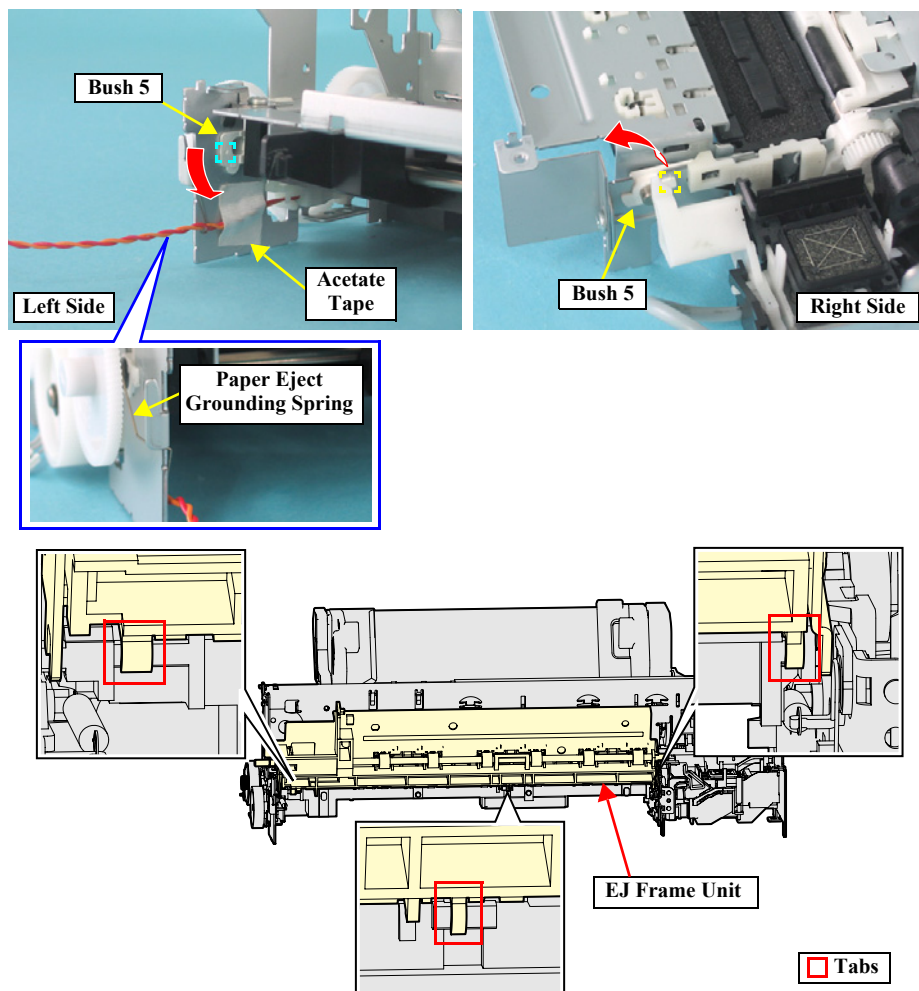
4.4.22 EJ Frame Unit

□ **External view (1)**

☐ **Part/Unit that should be removed before removing EJ Frame Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head / Printer Mechanism / Main Board Unit / CR Guide Frame / CR Motor / Carriage Unit / Front Frame

☐ **Removal procedure**

CAUTION !	■ **Do not hold the EJ Frame Unit while handling the Printer Mechanism in your repair.** ■ **Do not touch the rubber portion of the Eject Roller.**

1. Peel off the acetate tape (x1) that secures the PG Sensor Connector Cable.

2. Remove the Paper Eject Grounding Spring from the left side of the EJ Frame Unit.

3. Release the guide pin (x1, ▨) of Bush 5 on the left side of the EJ Frame Unit, and rotate the Bush 5 downward by 90°.

4. Release the guide pin (x1, ▨)of Bush 5 on the right side of the EJ Frame Unit, and rotate the Bush 5 upward (or downward) by 90°.

5. Release the tabs (x3, ☐) that secure the EJ Frame Unit while lifting the near side of the EJ Frame Unit upward.

Figure 4-40. Removing EJ Frame Unit

❑ **External view (2)**
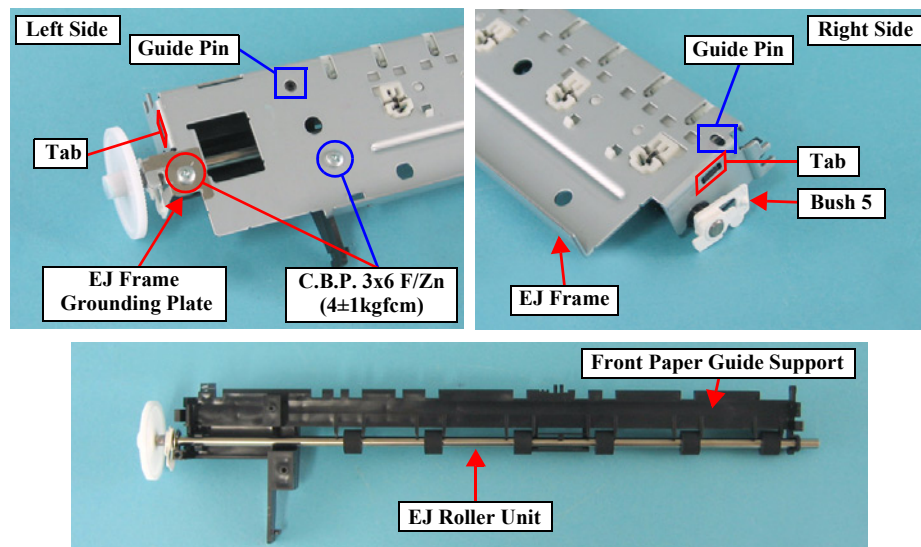
Figure 4-41. Removing EJ Roller Unit

6. Remove the right Bush 5 from the EJ Frame Unit.
7. Remove the screw (x1, ⬤) that secures the EJ Frame Grounding Plate, and remove the EJ Frame Grounding Plate.
8. Remove the screw (x1, ⬤) that secures the Front Paper Guide Support.
9. Remove the Front Paper Guide Support together with the EJ Roller Unit while releasing the tabs (x2, ☐) that secure the Front Paper Guide Support.

REASSEMBLY

- ■ **Match the guide pins (x2, ☐) of the Front Paper Guide Support with the positioning holes (x2) of the EJ Frame.**
- ■ **Confirm that Bush 5s on both sides are securely inserted into the notches of the Main Frame.**

Figure 4-42. Installing Bush 5s

- ■ **Make sure that there is no gap between the EJ Frame Unit and the Main Frame.**
- ■ **Check if the EJ Roller Unit moves smoothly.**

ADJUSTMENT REQUIRED

After replacing the Front Paper Guide Support with a new one, always apply grease G-46 to the specified parts.
- ■ **Refer to Figure 6-9 *(p191)* for details.**

4.4.23 Ink System Unit

☐ **External view**

Figure 4-43. Removing Ink System Unit
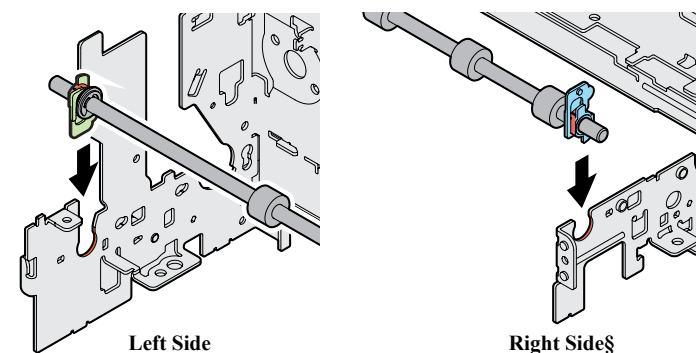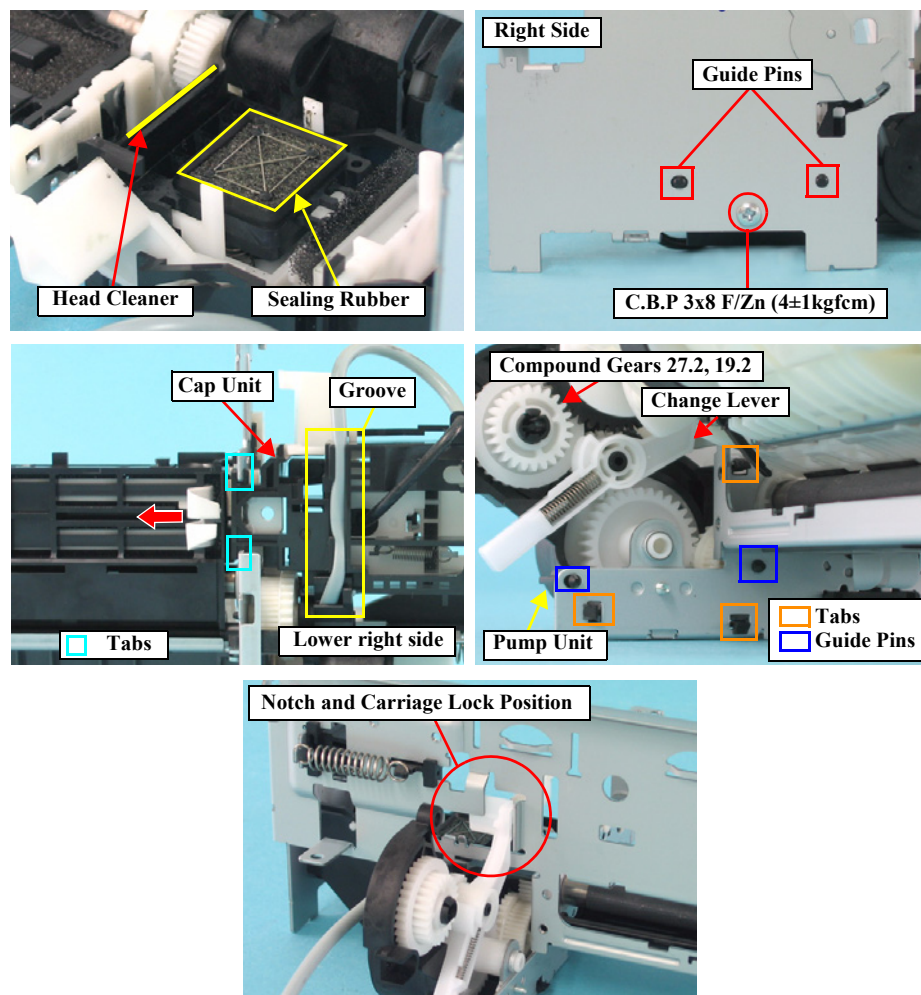
☐ **Part/Unit that should be removed before removing Ink System Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head / Printer Mechanism / Main Board Unit / ASF Unit / Holder Shaft Unit / CR Guide Frame / CR Motor / Carriage Unit / Front Frame

☐ **Removal procedure**

> **CAUTION** ⚠
> - **Do not touch or damage the Sealing Rubber or the Head Cleaner when performing the following work.**
> - **Mark the connection location before removing the Ink Tube.**

1. Release the Ink Tube from the groove on the downside of the Cap Frame.
2. Remove the screw (x1, ⚪) that secures the Cap Unit.
3. Slide the Cap Unit to the inside of the Main Frame, and release the tabs (x2, ☐) of the Cap Unit from the Main Frame.

> **CAUTION** ⚠
> **When removing the Ink System Unit, be careful not to drop the Change Lever and Compound Gears 27.2, 19.2.**

4. Release the Carriage Lock from the notch of the Main Frame.
5. Carefully release the tabs (x3, ☐) that secure the Pump Unit to the Main Frame, and remove the Pump Unit.
6. Remove the whole Ink System from the Printer Mechanism, and remove the gears (x4) and the Pump Pulley.

> **REASSEMBLY** ↩
> **When installing the Ink System Unit, follow the steps described below.**
> 1. **Place the Carriage Lock inside the notch of the Main Frame as shown in the figure.**
> 2. **Match the guide pins (x2, ☐) of the Pump Unit with the positioning holes (x2) of the Main Frame.**
> 3. **Match the guide pins (x2, ☐) of the Cap Unit with the positioning holes (x2) of the Main Frame.**
> 4. **Place the Ink Tube into the groove, and install the Ink System Unit.**

4.4.24 Paper Guide Front Unit

☐ **External view**
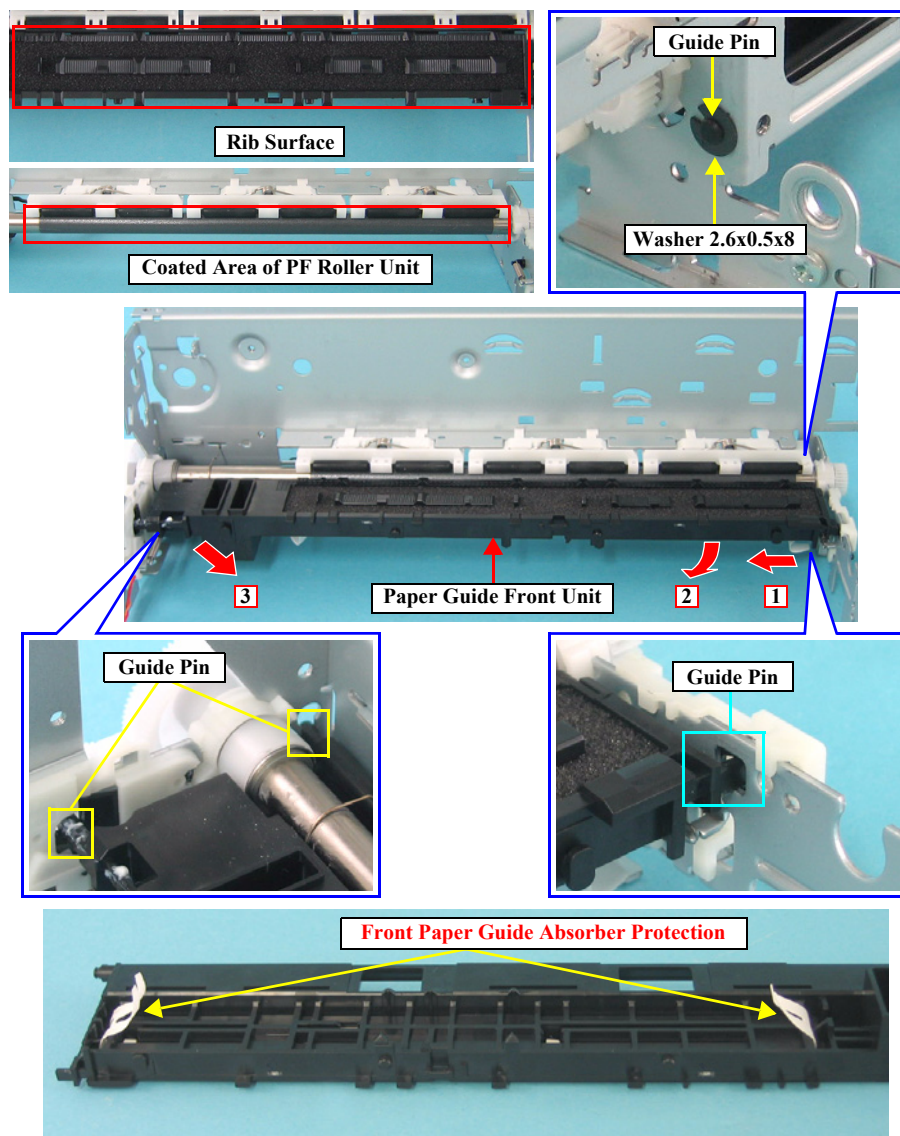
Figure 4-44. Removing Paper Guide Front Unit

☐ **Part/Unit that should be removed before removing Paper Guide Front Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head / Printer Mechanism / Main Board Unit / ASF Unit / Holder Shaft Unit / CR Guide Frame / CR Motor / Carriage Unit / Front Frame / EJ Frame Unit / Ink System Unit

☐ **Removal procedure**

> ⚠ **CAUTION**
>
> When performing the following work, pay attention to the following instructions.
> - Do not damage the ribs on the surface of the Paper Guide Front Unit.
> - Do not touch or damage the coated area of the PF Roller Unit
> - Be careful not to bend the **Front Paper Guide Absorber Protection** (x4). (The model with no card slot has three **Front Paper Guide Absorber Protection.**)

1. Remove the Plain Washer (x1) that secures the Paper Guide Front Unit with a tweezer.
2. Slide the Paper Guide Front Unit toward left while releasing the guide pin (x1, ☐) from the installation hole of the Main Frame.
3. Release the left guide pins (x2, ☐) of the Paper Guide Front Unit from the installation holes of the Main Frame while lowering the right end of the Paper Guide Front Unit.

> ↩ **REASSEMBLY**
>
> ■ Make sure that the **Front Paper Guide Absorber Protection** (x4) are facing inward. (The model with no card slot has three **Front Paper Guide Absorber Protection.**)
> ■ If ink has spread to the ribs on the upper surface of the Paper Guide Front Unit, clean off the ink with a cotton swab.

> 🔧 **ADJUSTMENT REQUIRED**
>
> ■ After replacing the Paper Guide Front Unit with a new one, always apply grease G-26 to the specified parts.
> - Refer to **Figure 6-9 (p191)** for details.
> ■ When having removed or replaced Paper Guide Front Unit, implement the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")
> - **"Bi-D adjustment"**

4.4.25 PG Sensor

☐ **External view**
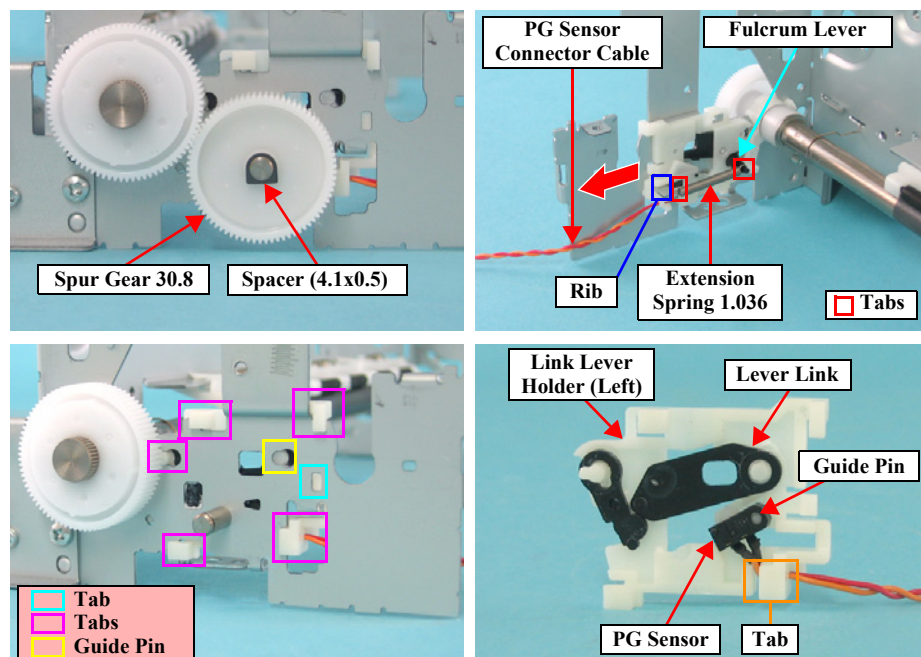
Figure 4-45. Removing PG Sensor

☐ **Part/Unit that should be removed before removing PG Sensor**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head / Printer Mechanism / Main Board Unit / ASF Unit / Holder Shaft Unit / CR Guide Frame / CR Motor / Carriage Unit / Front Frame / EJ Frame Unit / Ink System Unit / Paper Guide Front Unit

☐ **Removal procedure**

1. Remove the Spacer (x1) that secures Spur Gear 30.8, and remove Spur Gear 30.8 from the Main Frame.
2. Remove Extension Spring 1.036 from the tabs (1 each, ☐) of the Main Frame and the Fulcrum Lever (Left).
3. Remove the tab (x1, ☐) that secures the Link Lever Holder (Left) with a tweezer, and then slide it in the direction of the arrow shown in the figure.
4. Release the Link Lever Holder (Left) from the rib (x1, ☐) of the Main Frame, and remove the Fulcrum Lever (Left), Lever Link along with the Link Lever Holder (Left).
5. Release the PG Sensor Connector Cable from the tab (x1, ☐) of the Link Lever Holder (Left), and remove the PG Sensor.

REASSEMBLY
- ■ **Install the PG Sensor onto the guide pin of the Link Lever Holder (Left).**
- ■ **Secure the Link Lever Holder (Left) with the tabs (x6, ☐☐) and the guide pin (x1, ☐).**

ADJUSTMENT REQUIRED
After changing the Link Lever and the Link Lever Holder (Left) for new ones, always apply grease G-26 to the specified parts.
- ■ **Refer to Figure 6-11 *(p192)* for details.**

4.4.26 PF Roller Unit

☐ **External view (1)**
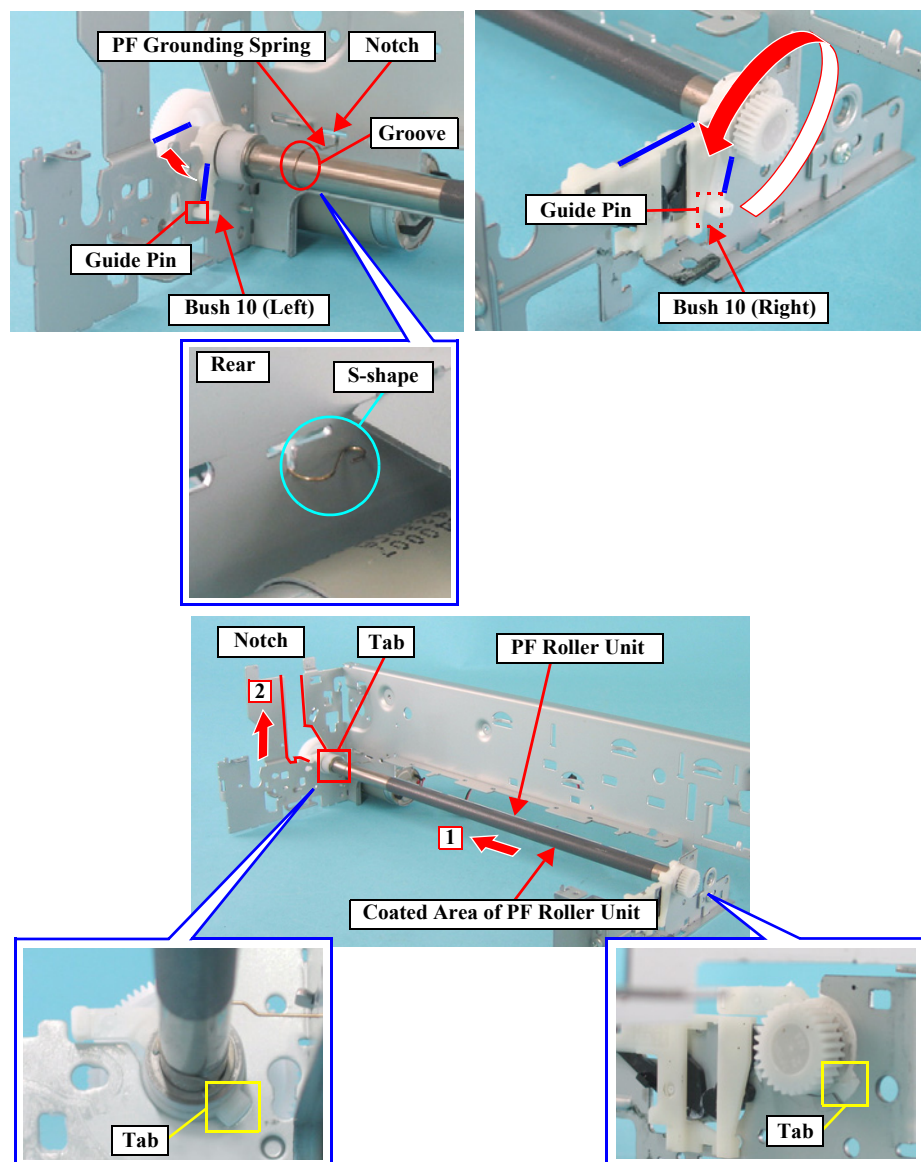
Figure 4-46. Removing PF Roller Unit (1)

☐ **Part/Unit that should be removed before removing PF Roller Unit**

Document Cover / Paper Support Assy. / Scanner Unit / Panel Unit / Housing Upper / Print Head/ Printer Mechanism / Main Board Unit / ASF Unit / Holder Shaft Unit / CR Guide Frame / CR motor / Carriage Unit / Paper Guide Upper Unit / Front Frame / EJ Frame Unit / Ink System Unit / Paper Guide Front Unit / PG Sensor

☐ **Removal procedure**

CAUTION	Do not touch or damage the coated area of the PF Roller Unit when performing the following work.

1. Release the PF Grounding Spring from the notch of the Main Frame with a tweezer, and remove the PF Grounding Spring from the PF Roller Unit.
2. Release the guide pin (x1, ☐) of Bush 10 (Left) from the Main Frame, and rotate Bush 10 (Left) to the position shown by the figure.
3. Release the guide pin (x1, ⬚) of Bush 10 (Right) from the Main Frame, and rotate Bush 10 (Right) to the position shown by the figure
4. Slide the PF Roller Unit toward left, and release the tabs (x1, ☐) of Bush 10 (Left/Right).
5. Remove the PF Roller Unit along the notch at the left end of the Main Frame.

REASSEMBLY	Hitch the PF Grounding Spring to the groove of the PF Roller Unit.

ADJUSTMENT REQUIRED	■ After changing the PF Roller Unit for a new one, always apply grease G-26 to the specified parts.
	  • Refer to **Figure 6-13** *(p192)* and **Figure 6-14** *(p193)* for details.
	■ After replacing the PF Roller Unit, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")
	  • **"PF Scale Sensor Positioning Adjustment"**

4.5 Scanner Section

4.5.1 Scanner Housing, Upper

☐   **External view**
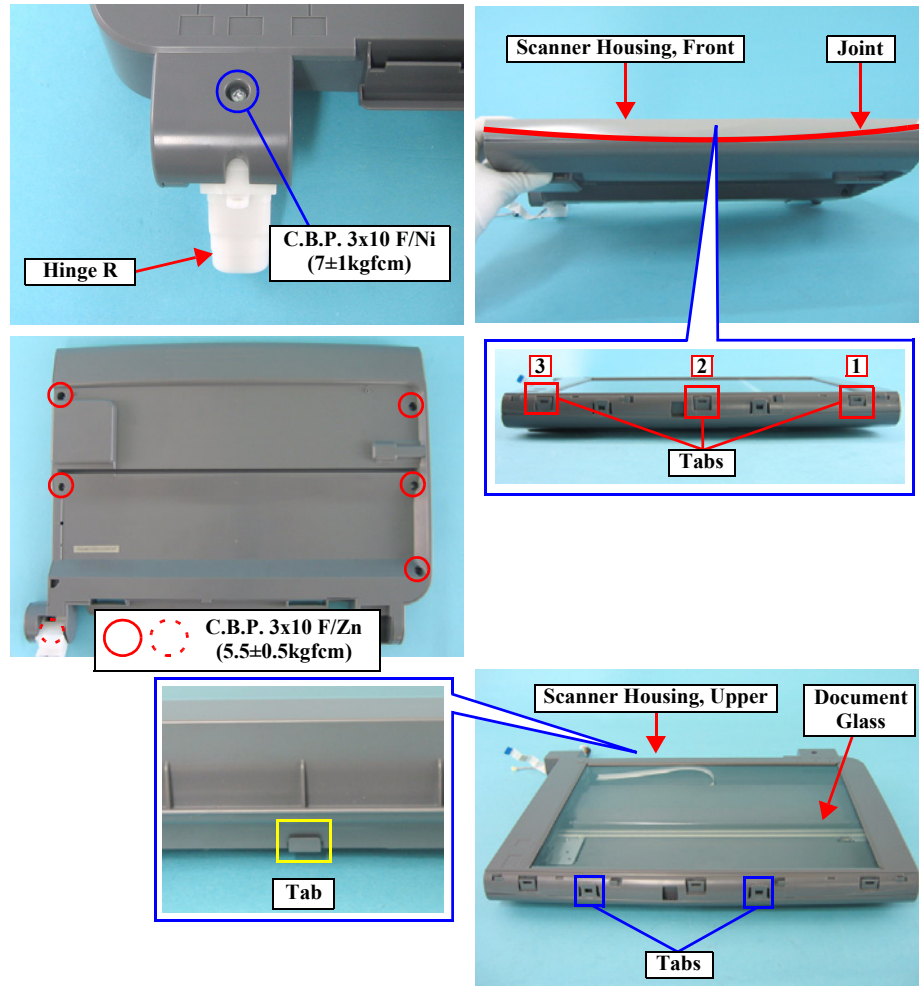
Figure 4-47. Removing Scanner Housing, Upper

☐   **Part/Unit that should be removed before removing Scanner Housing, Upper**
Document Cover / Scanner Unit

☐   **Removal procedure**

CAUTION	■ Following work should be performed in a room where there is a little dust. A clean room or a clean bench would be preferable. ■ Do not damage the document glass on the Scanner Housing, Upper.

1.   Remove the screw (x1, ⬤) that secures the hinge R, and remove the hinge R from the Scanner Unit.

CAUTION	Do not scratch the Scanner Housing, Upper and the Scanner Housing, Front with a precision screwdriver (-).

2.   Insert a precision screwdriver into the joint of the Scanner Housing, Upper and the Scanner Housing, Front, release the tabs (x3, ▢) that secure the Scanner Housing, Front in the order shown in the figure, and remove the Scanner Housing, Front.

3.   Remove the screws (x6, ⬤⬤) that secure the Scanner Housing, Upper.

4.   Release the tabs (x2, ▢) that secure the Scanner Housing, Upper, and remove the Scanner Housing, Upper.

REASSEMBLY	■ Match the notch of the Scanner Housing, Upper with the tab (x1, ▢) of the Scanner Housing, Lower. ■ Place the Scanner Housing, Front onto the Scanner Housing, Upper as shown below, slide the Scanner Housing, Front downward, and install it while pressing the Scanner Housing, Front against the Scanner Housing, Upper.

Figure 4-48. Installing Scanner Housing, Front

4.5.2 Scanner Carriage Unit

❑ **External view (1)**
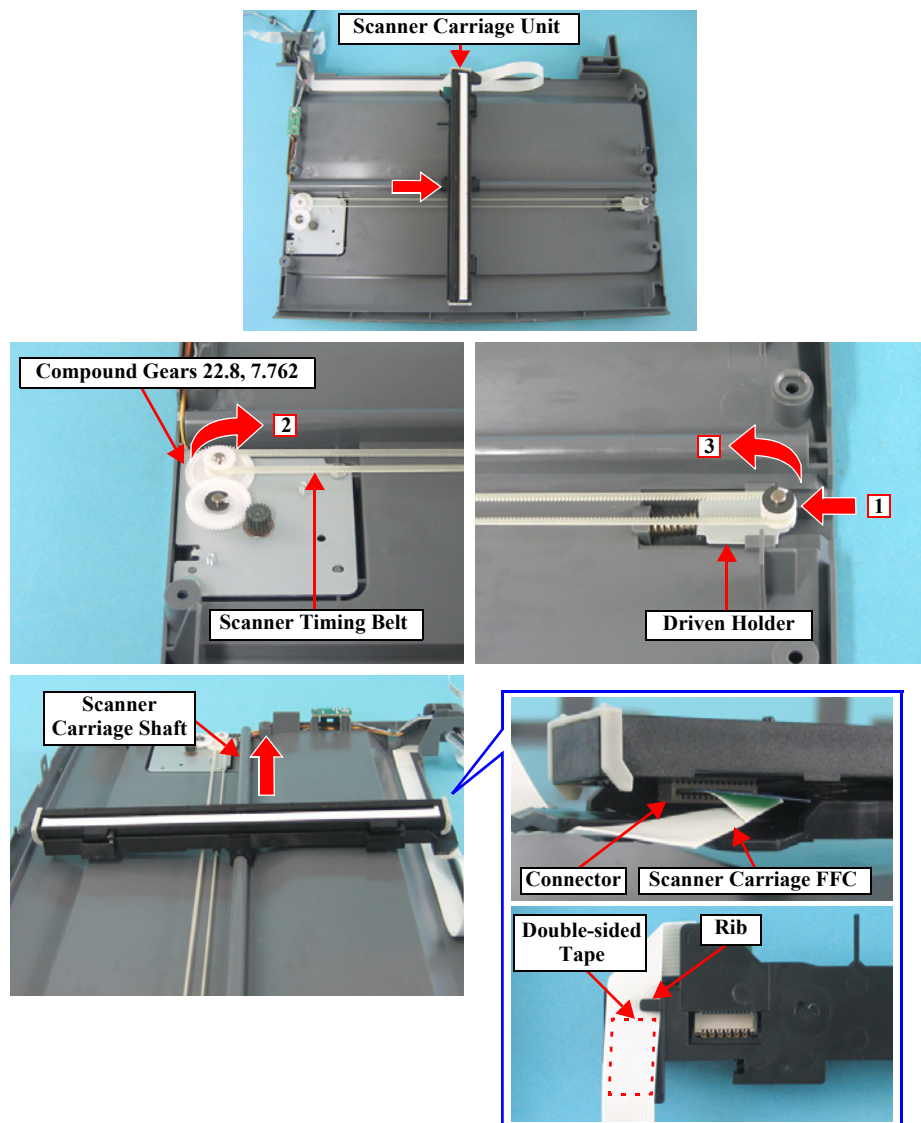
Figure 4-49. Removing Scanner Carriage Unit (1)

❑ **Part/Unit that should be removed before removing Scanner Carriage Unit**

Document Cover / Scanner Unit / Scanner Housing, Upper

❑ **Removal procedure**

CAUTION !	Do not scratch the Rod Lens Array when removing the Scanner Carriage Unit.
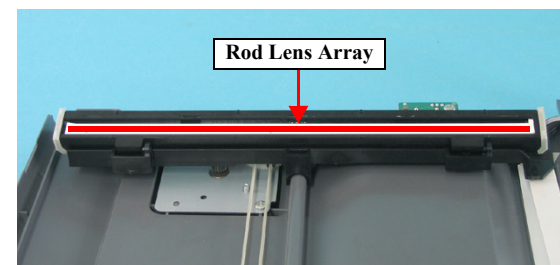
Figure 4-50. Handling Scanner Carriage Unit

1. Move the Scanner Carriage Unit to the center of the printer.

2. Push the Driven Holder to the direction of the arrow, and remove Compound Gears 22.8, 7.762, Driven Holder, and Scanner Timing Belt.

CAUTION !	Do not damage the Scanner Carriage FFC as it is secured with double-sided tape.

3. Disconnect the Scanner Carriage FFC from the Scanner Carriage Unit, and remove the Scanner Carriage Unit together with the Scanner Timing Belt.

☐ **External view (2)**
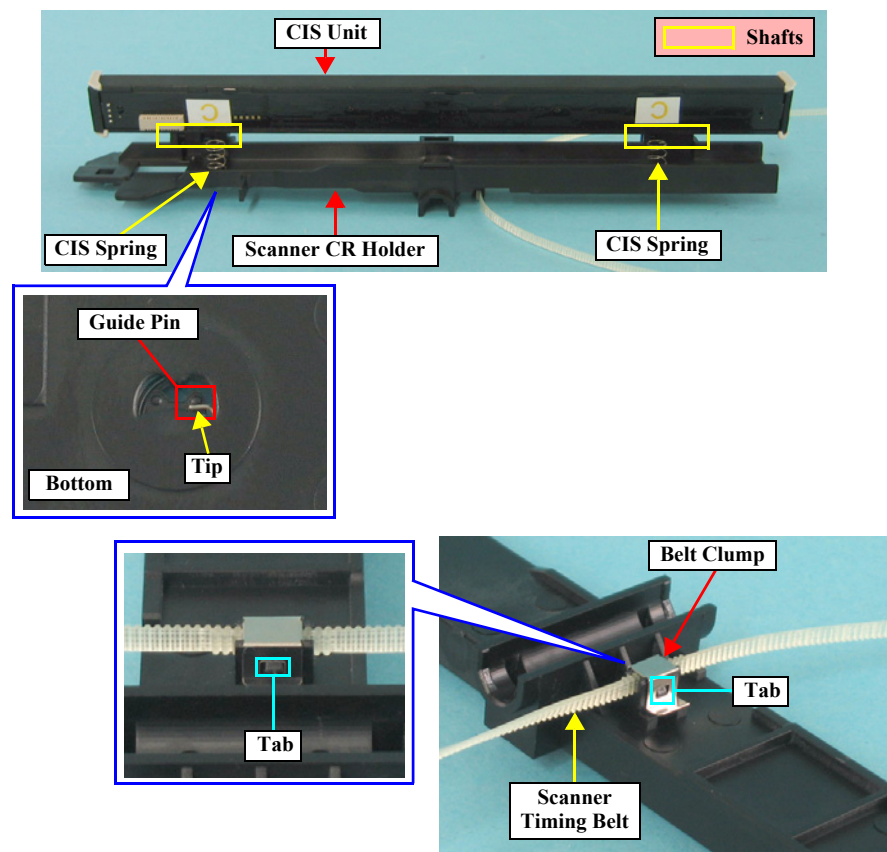
Figure 4-51. Removing Scanner Carriage Unit (2)

4. Open and slide the CIS Unit toward right, and remove the CIS Unit from the Scanner CR Holder.
5. Remove the CIS Spring (x2) from the Scanner CR Holder.
6. Release the tabs (x2, ☐) that secure the Belt Clump with a tweezer.
7. Remove the Scanner Timing Belt from the Scanner Carriage Unit.

| REASSEMBLY | ■ **Attach the Scanner Timing Belt to the Scanner Carriage Unit so that the part where the belt is jagged on both sides is pinched by the groove of the Scanner Carriage Unit.** |
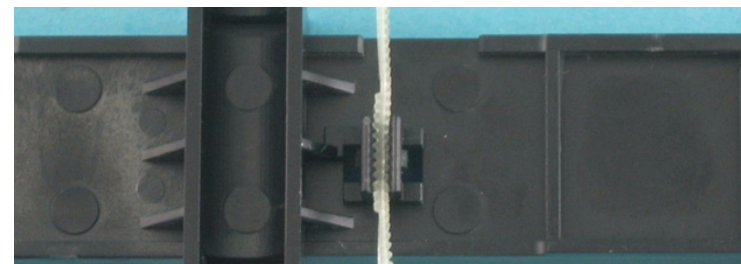
Figure 4-52. Attaching Scanner Timing Belt

■ **The CIS Springs (x2, ☐) should be installed with their tips hitched to the guide pin (x1, ☐) of the Scanner CR Holder.**

| ADJUSTMENT REQUIRED | After changing the Scanner Carriage Shaft for a new one, always apply grease G-26 to the specified parts.
■ Refer to **Figure 6-4** *(p190)* for details. |

4.5.3 Scanner Motor Unit/Scanner HP Sensor/ Driven Pulley

☐ **External view**
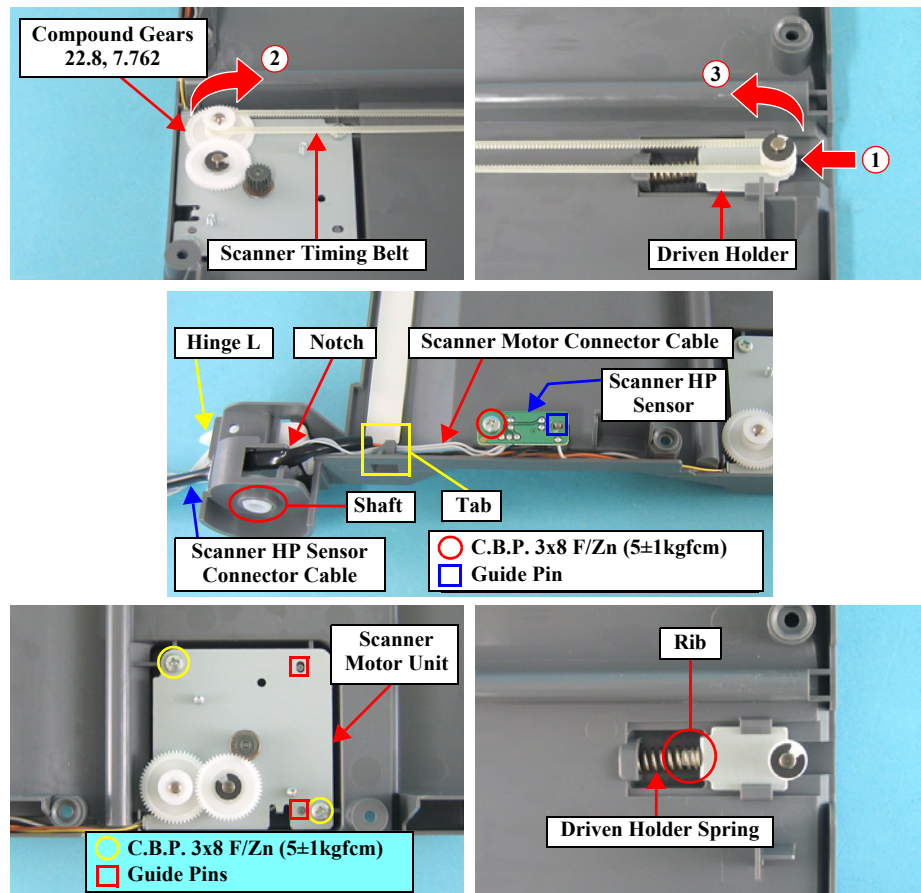
Figure 4-53. Removing Scanner Motor Unit/Scanner HP Sensor/Driven Holder

☐ **Part/Unit that should be removed before removing Scanner Motor Unit/ Scanner HP Sensor/Driven Holder**

Document Cover / Scanner Unit / Scanner Housing, Upper

☐ **Removal procedure**

1. Move the Scanner Carriage Unit to the center of the Scanner Unit.
2. Push the Driven Holder to the direction of the arrow, and remove Compound Gears 22.8, 7.762, Driven Holder, and Scanner Timing Belt.
3. Release the shaft of the hinge L from the bearing of the Scanner Housing, Lower.
4. Disconnect the Scanner Connector Cable and the Scanner HP Sensor Connector Cable from the tab of the hinge L, and pull them out from the notch of the Scanner Housing, Lower.
5. Remove the screw (x1, ⭕) that secures the Scanner HP Sensor, and remove the Scanner HP Sensor.
6. Release the Scanner Motor Connector Cable and the Scanner HP Sensor Connector Cable from the tab of the Scanner Housing, Lower.
7. Remove the screws (x2, ⭕) that secure the Scanner Motor Unit, and remove the Scanner Motor Unit.

■ **When installing the Scanner Motor Unit, match the guide pins (x2, ☐) of the Scanner Housing, Lower with the positioning holes (x2) of the Scanner Motor Unit.**

■ **When installing the Scanner HP Sensor, match the guide pin (x1) of the Scanner Housing, Lower with the positioning hole (x1, ☐) of the Scanner HP Sensor.**

■ **Route the Scanner Motor Connector Cable and the Scanner HP Sensor Connector Cable as shown in the figure.**

■ **Insert the Driven Holder Spring into the rib of the Driven Holder.**

4.6 Removal procedure Specific to the Model With No Card Slot (Stylus CX4100/CX4200/DX4200)

4.6.1 Printer Mechanism

☐ **External view**

- ◯ **C.B.P. 3x10 F/Zn** (4±1kgfcm)
- ◯ **C.B.P. 3x8 F/Zn** (4±1kgfcm)
- ◯ **C.B.S. 3x6 F/Zn** (4±1kgfcm)
- ☐ **Guide Pin**
- ☐ **Holding Positions**

Printer Mechanism

CR Guide Frame

Front Paper Guide Support

Guide Pin

PG Lever

Groove

Main Board

CN1

PS Connector Cable
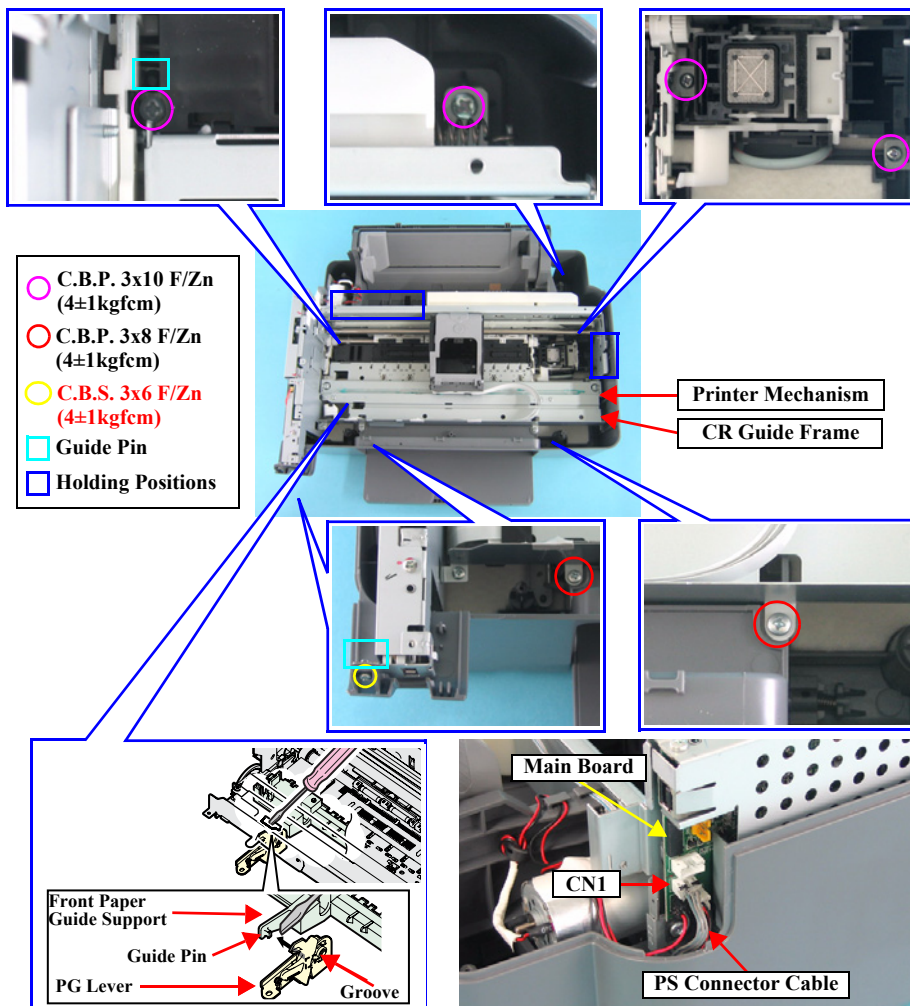
Figure 4-54. Removing Printer Mechanism

☐ **Part/Unit that should be removed before removing Printer Mechanism**

Document Cover / Paper Support Unit Assy. / Scanner Unit / Panel Unit / Housing, Upper

☐ **Removal procedure**

1. Follow the removal procedures Step 1 through Step 3 of Printer Mechanism *(p134)*.
2. Remove the screws (x7, ◯◯◯) that secure the Printer Mechanism.
3. Disconnect the PS Connector Cable from the connector (CN1) of the Main Board.

> **CAUTION**
>
> ⚠ Hold the designated positions when lifting up the Printer Mechanism in order to prevent deformation of the Main Frame.

4. Releasing the guide pins (x2, ☐) of the Front Paper Guide Support and the Housing, Lower from the groove of the PG Lever with a precision screwdriver (-), lift up the left side of the Printer Mechanism, and remove the whole printer mechanism from the Housing, lower.

WARNING

When installing the Printer Mechanism to the Housing, Lower, insert the Waste Ink Tube to the Eject Ink Joint and securely fasten the Waste Ink Tube with the Tube Clamp, or ink may leak from the Tube.

REASSEMBLY

■ When installing the Printer Mechanism to the Housing, Lower, match the guide pin (x1, ▢) of the Housing, Lower with the positioning hole (x1) of the Printer Mechanism.

■ When installing the Eject Ink Joint to the Housing, Lower, match the tab (x1, ▢) of the Eject Ink Joint with the positioning hole (x1) of the Housing, Lower.

■ When installing the Waste Ink Tube to the Eject Ink Joint, install them so that the handle of the Tube Clamp and the red line of the Waste Ink Tube are on the right side.

■ When installing the Rear Cover, match the tabs (x2, ▢) of the Rear Cover with the notches (x2) of the Housing, Lower.

REASSEMBLY

The assembled accuracy of each part composed of Printer mechanism is based on Housing Lower.

To ensure the assembled accuracy, you have to control the assembled standard position of main frame against X/Y/Z-axis direction as the following figure.

■ **[X-axis direction]**
Confirm that Printer Mechanism is properly placed in the channel of Housing Lower and that there is no gap.

■ **[Y-axis direction]**
Confirm that Printer Mechanism is properly placed in the channel of Housing Lower and that there is no gap.

■ **[Z-axis direction]**
Align the positioning hole (x1) of Printer Mechanism with the dowel (x1) of Housing Lower, and confirm that there is no gap.

X axis: 4 points
Y axis: 1 point
Z axis: 1 point
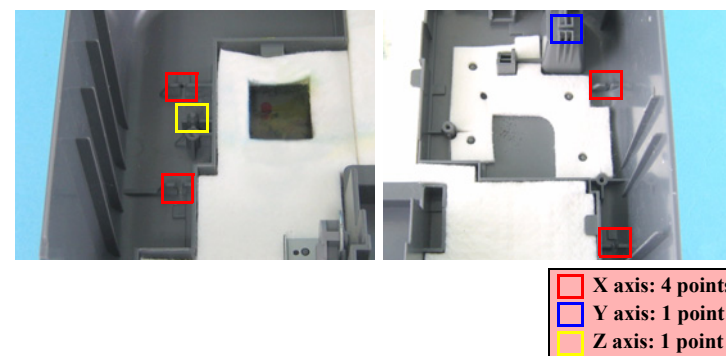
Figure 4-55. Assembled Standard Position of Main Unit

ADJUSTMENT REQUIRED

After replacing/removing the Printer Mechanism, perform the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")

1. **"Initialize PF Deterioration Offset"**
2. **"Disenable PF Deterioration Offset"**
3. **"CR Offset"**

4.6.2 Waste Ink Pads

☐　**External view**
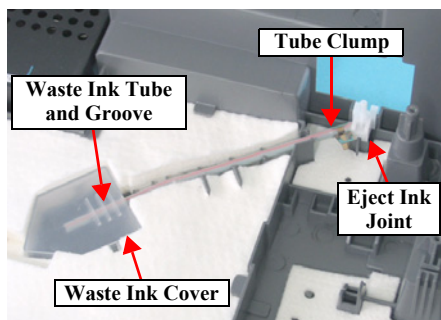
Figure 4-56. Waste Ink Pads

☐　**Part/Unit that should be removed before removing Waste Ink Pads**

Document Cover / Paper Support Assy. / Stacker / Scanner Unit / Panel Unit / Housing, Upper / Printer Mechanism

☐　**Removal procedure**

1. Perform the removal procedure Step 1 of Waste Ink Pads/Stacker Lock/PG Lever/Rubber Feet *(p138)*.
2. Follow the instructions below to remove the Waste Ink Tube.
    1. Release the Waste Ink Tube from the groove of the Housing, Lower.
    2. Pull out the Waste Ink Tube from the Waste Ink Cover.
    3. Remove the Waste Ink Tube together with the Tube Clump and the Eject Ink Joint.
3. Remove the Waste Ink Cover and 11 pieces of the Waste Ink Pads from the Housing, Lower.

REASSEMBLY

■ **When installing 11 pieces of the Waste Ink Pads, Waste Ink Tube, and the Waste Ink Cover, follow the steps described below.**

Step 1

Step 2

Waste Ink Tube

Step 3

Waste Ink Cover
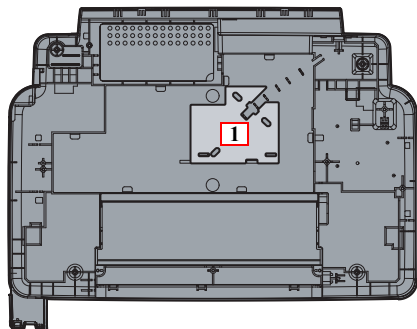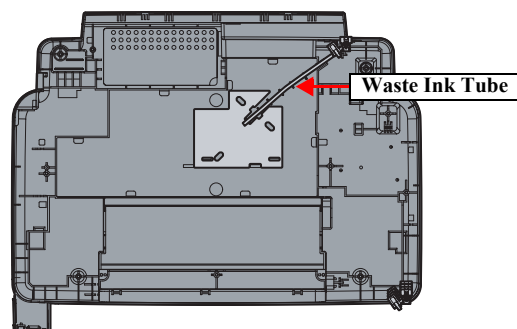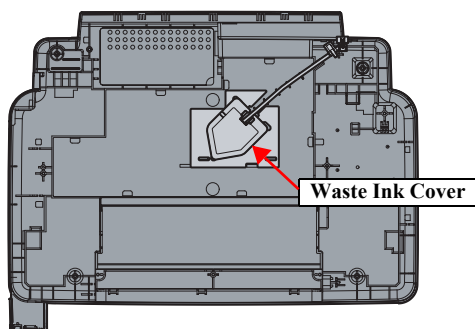
Figure 4-57. Installing Waste Ink Pads (1)

REASSEMBLY

Step 4
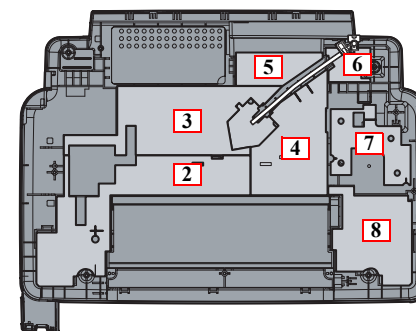
Step 5
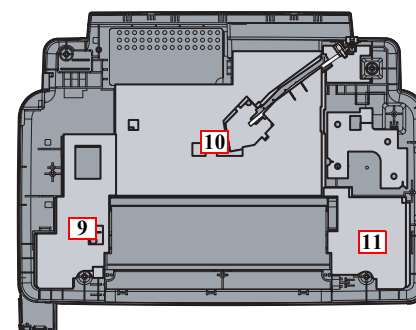
Figure 4-58. Installing Waste Ink Pads (2)

■ **When installing the Waste Ink Tube to the Housing, Lower, insert it to both the groove of the Housing, Lower and the Eject Ink Joint, and securely fasten the Waste Ink Tube with the Tube Clamp, or ink may leak from the Tube.**

■ **When installing the PG Lever Mounting Plate to the Housing, Lower, match the guide pins (x2, ☐) with the positioning holes of the PG Lever Mounting Plate.**

ADJUSTMENT REQUIRED

After replacing the Waste Ink Pads, perform the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")

■ **"Waste Ink Pad Counter"**

ADJUSTMENT

5.1 Overview

This section describes the procedure for adjustments required when the printer is disassembled and assembled for repair or service.

5.1.1 Required Adjustments

If you remove or replace the specific part in your service/repair, you have to perform the appropriate adjustment as listed Table 5-1 below.

In this printer, it is necessary to perform appropriate adjustment in order to maintain consistent printing function and quality, eliminate differences of each printer mechanism's characteristics. Therefore, in case that the combination between the printer mechanism and the Main Board changes or the Print Head is replaced during the repair service, you must input the correct adjustment value into the EEPROM on the Main Board by using the Adjustment program.

> **CHECK POINT** ✓
>
> **In case that any parts are removed and assembled on the repair product while running the Adjustment program, make sure to turn off the printer.**

Table 5-1. Required Adjustments

Replaced part	Adjustment item	EEPROM data copy	Market setting	USB ID input	Waste ink pad counter	Ink charge	Head ID input	Top margin adjustment	First dot adjustment	PW sensor adjustment	Head angular adjustment	Bi-d adjustment	PF deterioration adjustment*1	CR offset	PF adjustment	PF band adjustment
ASF unit	removal	---	---	---	---	---	---	O	O	O	---	---	O	---	O	O
	replacement	---	---	---	---	---	---	O	O	O	---	---	O	---	O	O
CR motor	removal	---	---	---	---	---	---	---	O	O	---	O	---	---	---	---
	replacement	---	---	---	---	---	---	---	O	O	---	O	---	O	---	---
Paper guide upper	removal	---	---	---	---	---	---	O	---	---	---	---	O	---	O	O
	replacement	---	---	---	---	---	---	O	---	---	---	---	O	---	O	O
Front frame	removal	---	---	---	---	---	---	---	O	---	O	O	---	---	---	---
	replacement	---	---	---	---	---	---	---	O	---	O	O	---	---	---	---
Print head	removal	---	---	---	---	---	---	O	O	O	O	O	O	---	O	O
	replacement	---	---	---	---	O	O	O	O	O	O	O	O	---	O	O

Replaced part	Adjustment item	EEPROM data copy	Market setting	USB ID input	Waste ink pad counter	Ink charge	Head ID input	Top margin adjustment	First dot adjustment	PW sensor adjustment	Head angular adjustment	Bi-d adjustment	PF deterioration adjustment*1	CR offset	PF adjustment	PF band adjustment
Main board	removal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	replacement (read Ok)	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	replacement (read NG)	---	O	O	(pad replacement)	---	O	O*2	O	O	O	O	O	O	O	O
Holder shaft unit	removal	---	---	---	---	---	---	O	---	O	---	---	---	---	---	---
	replacement	---	---	---	---	---	---	O	---	O	---	---	---	---	---	---
EJ roller assy	removal	---	---	---	---	---	---	---	---	---	---	---	O	---	O	O
	replacement	---	---	---	---	---	---	---	---	---	---	---	O	---	O	O
PS board	removal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	replacement	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---
Paper guide front	removal	---	---	---	---	---	---	O	O	O	O	O	O	---	O	O
	replacement	---	---	---	---	---	---	O	O	O	O	O	O	---	O	O
PF motor	removal	---	---	---	---	---	---	O	---	---	---	---	O	---	O	O
	replacement	---	---	---	---	---	---	O	---	---	---	---	O	---	O	O
Waste ink pad	removal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	replacement	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---
PW sensor	removal	---	---	---	---	---	---	---	O	O	---	---	---	---	---	---
	replacement	---	---	---	---	---	---	---	O	O	---	---	---	---	---	---

Replaced part / Adjustment item	EEPROM data copy	Market setting	USB ID input	Waste ink pad counter	Ink charge	Head ID input	Top margin adjustment	First dot adjustment	PW sensor adjustment	Head angular adjustment	Bi-d adjustment	PF deterioration adjustment*1	CR offset	PF adjustment	PF band adjustment
CR unit — removal	---	---	---	---	---	---	O	O	O	O	O	---	---	O	O
CR unit — replacement	---	---	---	---	---	---	O	O	O	O	O	---	O	O	O
CR guide shaft — removal	---	---	---	---	---	---		O	O	---	O	---	---	---	---
CR guide shaft — replacement	---	---	---	---	---	---	---	O	O	---	O	---	O	---	---
Star wheel assy. — removal	---	---	---	---	---	---	---	---	---	---	---	O	---	O	O
Star wheel assy. — replacement	---	---	---	---	---	---	---	---	---	---	---	O	---	O	O
PF roller assy — removal	---	---	---	---	---	---	O	---	O	---	---	O	---	O	O
PF roller assy — replacement	---	---	---	---	---	---	O	---	O	---	---	O	---	O	O

Note *1: There are two kinds of adjustment to the PF deterioration adjustment: "initialize PF deterioration offset" and "disenable PF deterioration offset".

*2: If the printer you make repairs on is equipped with an ASF frame for Stylus CX4700/CX4800/DX4800/DX4850, following values should be entered in advance:
Address 5A<H> Data 39 <H>
If the printer is equipped with an ASF frame for Stylus CX4500/CX4600 (first mass production of IEI Stylus CX4700/CX4800/DX4800/DX4850), these values need not to be entered.

CAUTION

- When the Main board is replaced with a new one, you may have to replace waste drain ink pad also in case the EEPROM parameter back up function is not available on the defective main board.
- After completing the adjustment, check the printing result with A4 check pattern by using the Adjustment program. If the result is not good, perform appropriate adjustment.
- If using new main board in the printer mechanism replacement, you need to perform EEPROM initial setting of main board. And then, please perform the adjustment by usual procedure.

5.2 Adjustment by Using Adjustment Program

The procedures of the adjustment items will be explained here. The intended item is as follows.

- ☐ EEPROM Data Copy

- ☐ Market Setting

- ☐ USB Input ID

- ☐ Waste Ink Pad Counter

- ☐ Ink Charge

- ☐ Head ID Input

- ☐ Top Margin Adjustment

- ☐ First Dot Adjustment

- ☐ PW Sensor Adjustment

- ☐ Head Angular Adjustment

- ☐ Bi-D Adjustment

- ☐ PF Deterioration Adjustment

  - ■ Initialize PF deterioration offset

  - ■ Disenable PF deterioration offset

- ☐ CR Offset

- ☐ PF Adjustment

- ☐ PF Band Adjustment

5.2.1 EEPROM Data Copy

☐ **Adjustment procedure**

1. Select "EEPROM Data Copy" in the Adjustment Program.

2. Click the [backup] button to backup the old main board data.

3. When the backup operation is succeeded,
    1) Replace the Main Board Unit with a new one.
    2) Turn on the printer and click the [restore] button.
    3) When the restore operation is succeeded, click the [next] button to perform necessary adjustment.

    When the backup operation is failed,
    1) Click the [next] button to perform necessary adjustment.

5.2.2 Market Setting

☐ **Adjustment procedure**

1. Select "Destination setting" in the Adjustment Program.

2. Click the [Destination setting] button to set the market destination setting.

5.2.3 USB ID

☐ **Adjustment procedure**

1. Select "Destination setting" in the Adjustment Program.

2. Input the 10-digits serial number from the label applied to the back side of the Housing Lower.

5.2.4 Waste Ink Pad Counter

☐ **Adjustment procedure**

1. Select "Waste ink pad counter" in the Adjustment Program.

2. Click the [Read] button, you can see the current or initialized counter value.

3. If you replace the waste ink pad, click the [Initialize] button to clear the current ink pad counter to "zero". Once you click the [Initialize] button, you can see its completion message, so that click the [OK] button.

5.2.5 Ink Charge

☐ **Adjustment procedure**

1. Select "Ink charge" in the Adjustment Program.

2. Click the [Ink charge] button to perform the initial ink charge setting.

5.2.6 Head ID Input

☐ **Adjustment procedure**

1. Select "Input Head ID" in the Adjustment Program.

2. Input the 13-digits code of the Head ID label applied to the Print Head. Enter the Head ID from left to right on the top row and from top to bottom in due order.

5.2.7 Top Margin Adjustment

☐ **Adjustment procedure**

1. Set Normal Paper A4/Letter on the Paper Support.

2. Select "Top margin adjustment" in the Adjustment Program.

3. Click the [Print] button to print the Top margin adjustment pattern.

4. Confirmed the printed pattern and measure exact distance from Paper top edge to a line.

5. Input your decided parameter to the edit box and click the [Input] button.
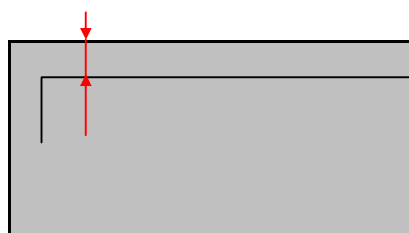
[Judging Standard]
The distance from a paper top edge to a line is:
• 3.7 to 5.1mm Choose the "-" from a combobox.
• 2.3 to 3.7mm Choose the "0" from a combobox.
• 0.9 to 2.3mm Choose the "+" from a combobox.

Figure 5-1. Top Margin Adjustment Printing Pattern

5.2.8 First Dot Adjustment

☐ **Adjustment procedure**

1. Set Photo Paper A4/Letter on the Paper Support.

2. Select "First dot position adjustment" in the Adjustment Program.

3. Click the [Print] button to print the First dot position adjustment pattern.

4. Check the printed patterns and select a pattern number that has 5mm margin from the paper edge.

5. Click the [Input] button to write the adjustment value of checked item.

☐ **[Treatment procedure for NG product]**

1. Replace the repaired (replaced) part with new one.

2. Print the check pattern, and check the adjustment result.

3. If the result is NG level, confirm the installation condition of removed parts during disassembly.

4. Perform Step 2 again.

[Judging Standard]
Standard: 5mm away from left edge.

Figure 5-2. First dot position adjustment Printing Pattern

5.2.9 PW Sensor Adjustment

☐ **Adjustment procedure**

1. Set Photo Paper A4/Letter on the Paper Support.

2. Select "PW adjustment" in the Adjustment Program.

3. Click the [Print] button to print the PW adjustment pattern.

4. Check the printed patterns and select a pattern number that has 5mm margins from the paper edges.

5. Click the [Input] button to write the adjustment value of checked items.

☐ **[Treatment procedure for NG product]**

1. Replace the PW Sensor with new one again.

2. Print the check pattern, and check the adjustment result.

3. If the result is NG level, confirm the installation condition of removed parts during disassembly.

4. Perform Step 2 again.

[Judging Standard]
Top / Bottom / Right / Left: 5mm

Figure 5-3. PW adjustment Printing Pattern

5.2.10 Head Angular Adjustment

☐ **Adjustment procedure**

1. Set Normal Paper A4/Letter on the Paper Support.

2. Select "Head angular adjustment" in the Adjustment Program.

3. Click the [Print] button to print following two head angular check patterns.
   • Band pattern
   • Raster offset pattern

4. Check the printed patterns and select a pattern number that has the least amount of misalignment.

5. Click the [Input] button to write the adjustment value of checked items.

6. Print the check pattern again, and check the adjustment result.

☐ **[Treatment procedure for NG product]**

1. Replace the Print Head with new one again.

2. Print the check pattern, and check the adjustment result.

3. If the result is NG level, confirm the installation condition of removed parts during disassembly.

4. Perform Step 2 again.

■ **Band pattern**
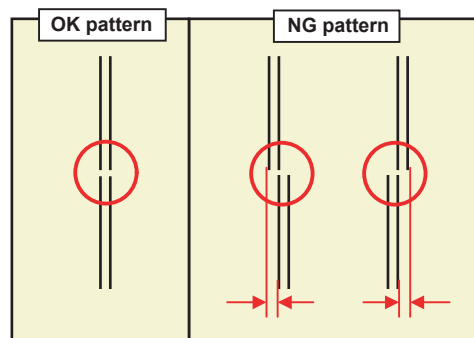
[Judging Standard]
The printed line should be straight line.

[Reference]
Shift length of Head Angular pattern is MAX ±50μm

■ **Raster offset pattern**
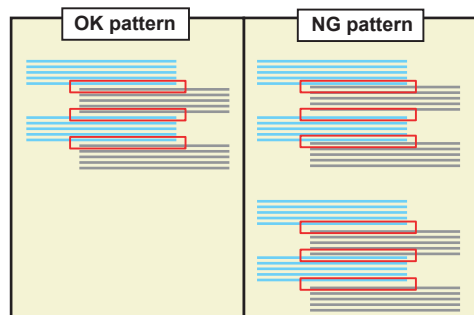
[Judging Standard]
Spaces between the cyan lines and gray lines should be uniformed.

[Reference: Standard value in manufactory]
±70μm

Figure 5-4. Head Angular Adjustment Printing Pattern

5.2.11 Bi-D adjustment

☐ **Adjustment procedure**

1. Set Normal Paper A4/Letter on the Paper Support.

2. Select "Bi-D adjustment" in the Adjustment Program.

3. Click the [Print] button to print the Bi-D adjustment pattern.

4. Check the printed patterns and select a pattern number that has the least amount of misalignment in each of the VSD dots.

5. Click the [Input] button to write the adjustment value of checked items.

6. Print the check pattern again, and check the adjustment result.

☐ **[Treatment procedure for NG product]**

1. Replace the Print Head with new one again.

2. Print the check pattern, and check the adjustment result.

3. If the result is NG level, confirm the installation condition of removed parts during disassembly.

4. Perform Step 2 again.
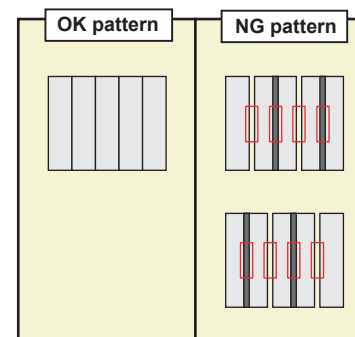
[Judging Standard]
The block patterns should align without gap and overlapping.

[Reference]
GAP Bi-D for each Dot

• VSD1 BLACK, COLOR: 60μm
• VSD3 BLACK, COLOR: 40μm

Figure 5-5. Bi-D Adjustment Printing Pattern

5.2.12 Initialize PF Deterioration Offset

❑ **Adjustment procedure**

1. Select "Initialize PF deterioration offset" in the Adjustment Program.

2. Click the [Initialization] button to initialize the PF deterioration offset value.

5.2.13 Disenable PF Deterioration Offset

❑ **Adjustment procedure**

1. Select "Disenable PF deterioration offset" in the Adjustment Program.

2. Click the [Input] button to input the maximum value (3,000) of the PF deterioration offset value.

5.2.14 CR Offset

❑ **Adjustment procedure**

1. Select "CR motor heat protection control" in the Adjustment Program.

2. Check each box of the replaced parts/units checklist and then click the [Perform] button.

3. A dialogue box will be displayed, and click the [OK] button in the box.Market destination setting

❑ **Adjustment procedure**

1. Select "Destination setting" in the Adjustment Program.

2. Click the [Destination setting] button to set the market destination setting.

5.2.15 PF Adjustment (TBD)

5.2.16 PF Band Adjustment (TBD)

5.3 Adjustment Except Adjustment Program

Following is adjustment except Adjustment Program.

5.3.1 PG Adjustment

☐ **Parts to be Removed and Replaced**

  ■ Removal and Replacement of Carriage Unit

  ■ Removal and Replacement of Print Head

☐ **Adjustment procedure**

  1. Make sure that the printer is turned off.

  2. Set the ink cartridges into the Carriage Unit

  3. Prepare the thickness gauge. (The thickness should be 1.45mm.)

  4. Loosen the screw (C.B.S 3x6) for securing the Parallel Adjustment Lever (Left).

> **CAUTION**
> ■ **Do not remove a screw completely. (two or three revolution)**
> ■ **You need not to loosen the screw securing the Parallel Adjustment Lever (Right).**
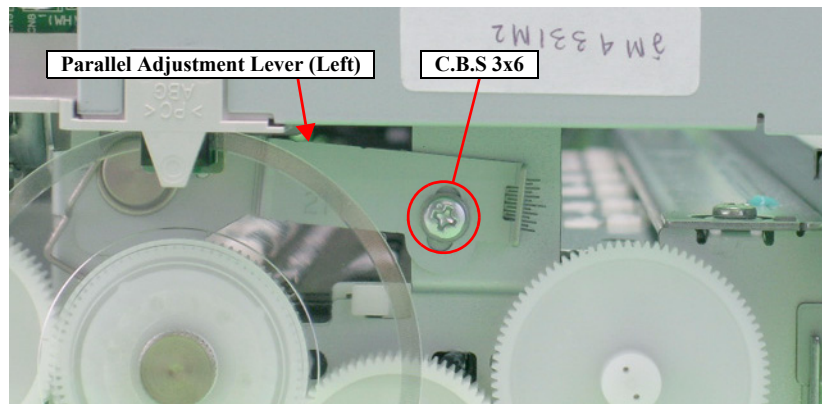
Figure 5-6. Parallel Adjustment Lever (Left) Location

  5. Release the Carriage Lock if the Carriage Unit is locked.

  6. Set the thickness gauge at the position shown by the figure. The thickness gauge should be placed between the front of the Paper Guide Front Unit and the center ribs.
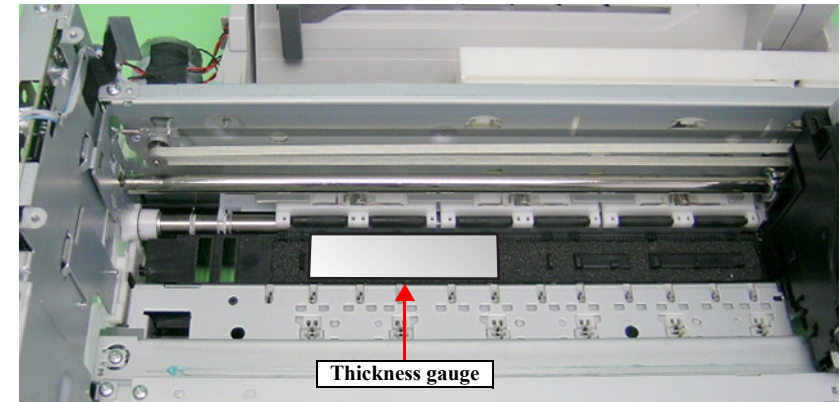
Figure 5-7. Placement position for thickness gauge

  7. Confirm that PG Lever is lowered. If PG Lever is raised, lower it.

  8. Move the Carriage Unit on the thickness gauge by using the Timing Belt, and check whether the thickness gauge moves or not.

> **CAUTION**
> ■ **If you push the Carriage Unit directly, it's possible to damage the Print Head surface by the friction with the thickness gauge.**
> ■ **Following is the relationship between "Parallel Adjustment Lever (Left) operation" and "Platen gap reaction".**
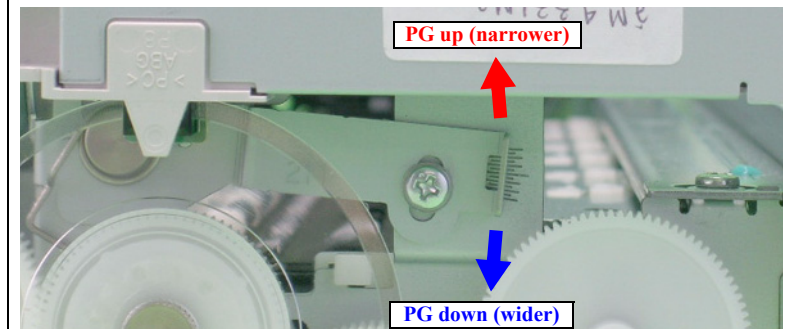
Figure 5-8. Relationship between Parallel Adjustment Lever (Left) Operation & Platen Gap

9.   Accede to following steps until you've completed the left side PG adjustment.

START

Step 8

Move the Carriage Unit by using the Timing Belt.

Thickness Gauge moves? → **Yes**

No

One notch up the Parallel Adjustment Lever (Left).

Note : "Up" means PG (Platen Gap) narrow.

Note : "Down" means PG (Platen Gap) wide.

One notch down the Parallel Adjustment Lever (Left).

Move the Carriage Unit by using the Timing Belt.

Thickness Gauge moves?

Yes

No

Advance to Step 10.
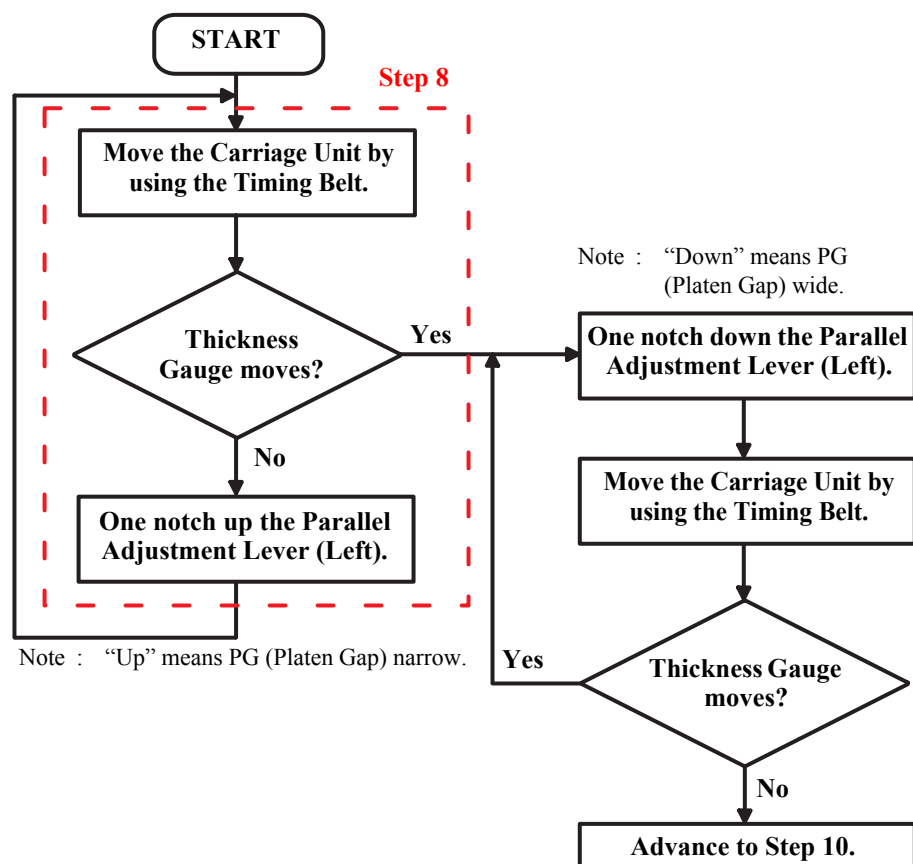
Figure 5-9. Left Side PG Adjustment

10. Tighten the screw for securing Parallel Adjustment Lever (Left) temporary.

11. Loosen the screw (C.B.S 3x6) for securing the Parallel Adjustment Lever (Right).
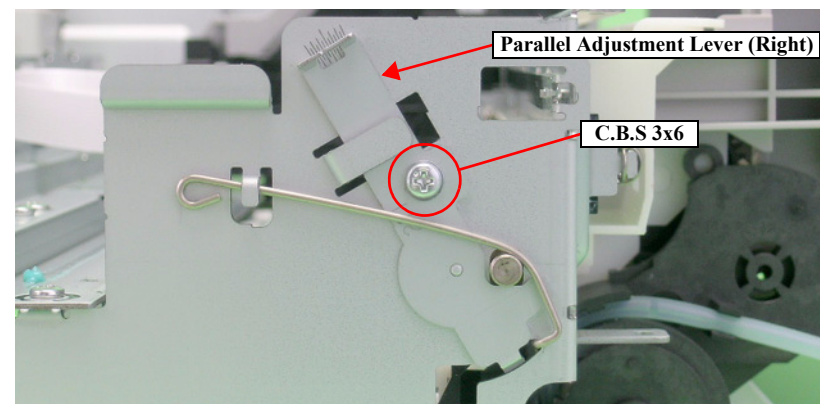
Figure 5-10. Parallel Adjustment Lever (Right) Location

CAUTION

- Do not remove a screw completely. (two or three revolution)
- You need not to loosen the screw for securing the Parallel Adjustment Lever (Light).

12. Set the thickness gauge at the position shown by the figure. The thickness gauge should be placed between the front of the Paper Guide Front Unit and the center ribs.
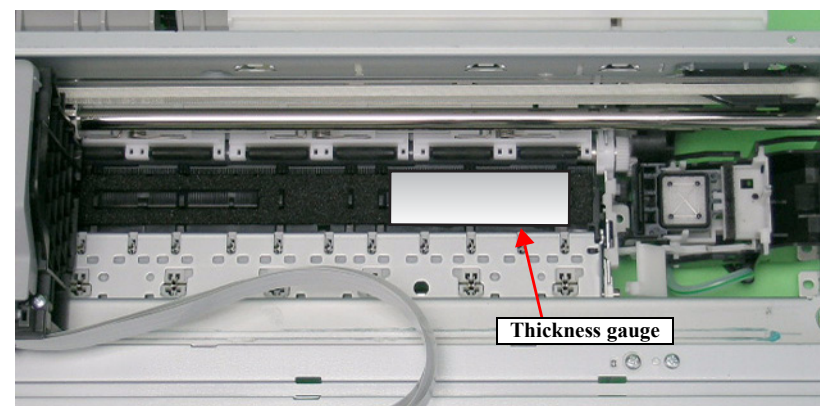
Figure 5-11. Placement position for thickness gauge

13. Move the Carriage Unit on the thickness gauge by using the Timing Belt, and check whether the thickness gauge moves or not.

> **⚠ CAUTION**
>
> ■ **If you push the Carriage Unit directly, it's possible to damage the Print Head surface by the friction with the thickness gauge.**
> ■ **Following is the relationship between "Parallel Adjustment Lever (Right) operation" and "Platen gap reaction".**
>
> PG up (narrower)
>
> PG down (wider)
>
> **Figure 5-12. Relationship between Parallel Adjustment Lever (Right) Operation & Platen Gap**
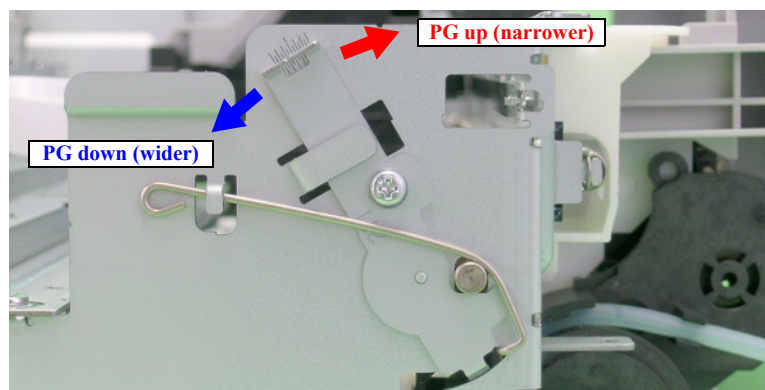
14. Accede to following steps until you've completed the right side PG adjustment.
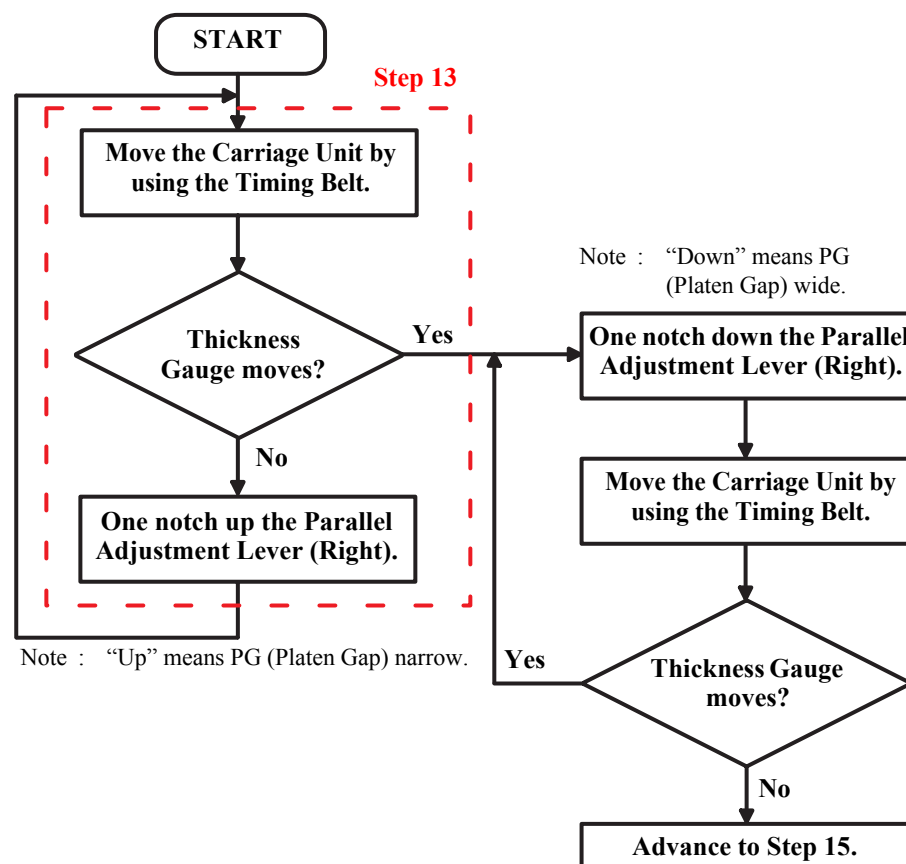
Figure 5-13. Right Side PG Adjustment

Note : "Down" means PG (Platen Gap) wide.

Note : "Up" means PG (Platen Gap) narrow.

15. Tighten the screw securing for Parallel Adjustment Lever (Right) temporary.

16. Set the thickness gauge at position shown by Figure 5-7 again.

17. Accede to following steps to check left side PG again.
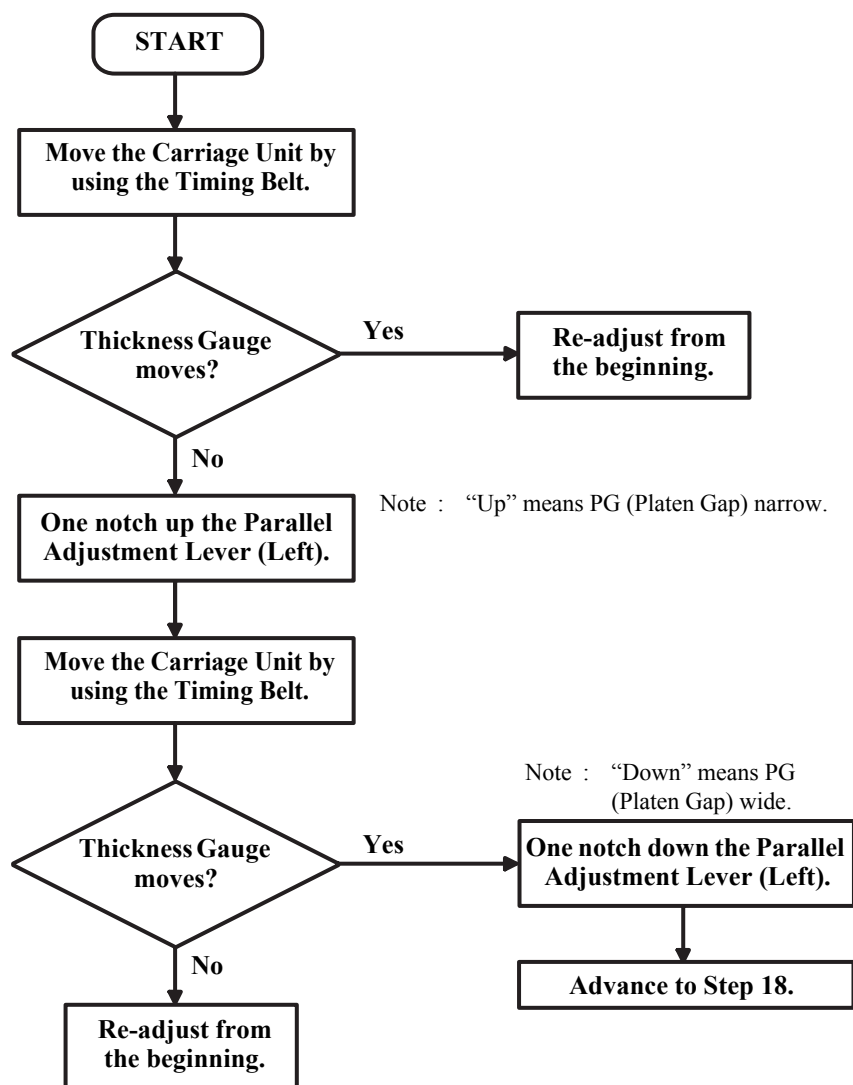
Figure 5-14. Right/Left Sides PG Checking

18. Tighten both screws completely.

5.3.2 PF Scale Sensor Positioning Adjustment

☐ **Parts to be Removed and Replaced**

■ Replacement of Main Board Unit

■ Replacement of PF Roller Unit

☐ **Adjustment procedure**

1. Test fit Main Board Unit, and confirm whether or not PF Scale is positioned in the center of PF Sensor.

2. If PF Scale is positioned in the center of PF Sensor, adjustment is complete. If scale is not positioned in center of sensor, adjust position of PF Scale using spacer (0.5mm thickness) as shown in diagram below.

Spacer is not applied to Main Board Unit for service part.

■ **Place spacer between Shield Board and Main Board.**

■ **If PF Scale is off to the left, remove the spacer.**

■ **If PF Scale is off to the right, add an additional spacer. (Total of 2 spacers)**
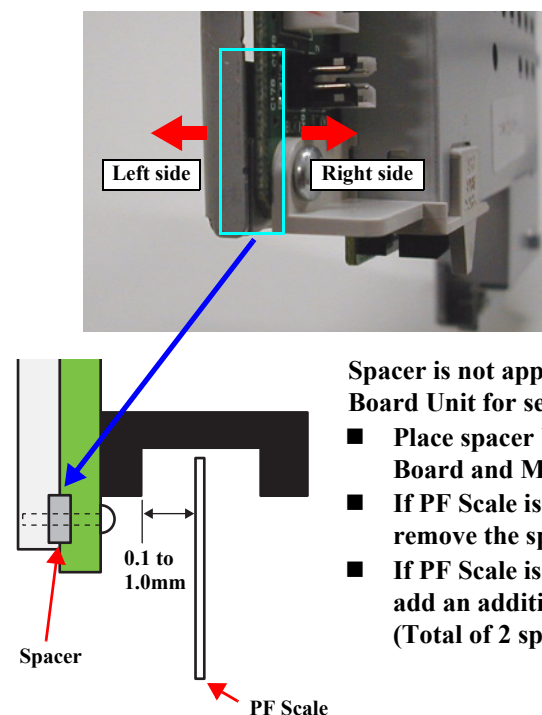
Figure 5-15. PF Scale Sensor positioning adjustment

5.3.3 Original Adjustment

❑ **Parts to be removed and replaced**

■ Replacement of Scanner Housing, Upper

■ Replacement of Scanner Unit

CAUTION !	■ **This adjustment requires the FT (Function Test) program and the exclusive adjustment jig.** ■ **If the setting of the printer differs from the one mentioned in the following procedure, this adjustment could not be completed correctly. In that case, the edge of the Scanner Housing, Upper may be read in during scanning or copying.**

❑ **Adjustment procedure**

1. Hold down the [Color Start] + [Paper Size]+ [Fit to Page] and turn the printer on. Keep pressing those buttons for five seconds, and the printer turns to the scanner mode.

* This adjustment could be performed if turning on the printer without pressing those buttons, however, necessary time to transit to the ready mode becomes shorter by following this approach.

2. Install "C592B00W.exe" to the computer, and put the FT program into place.
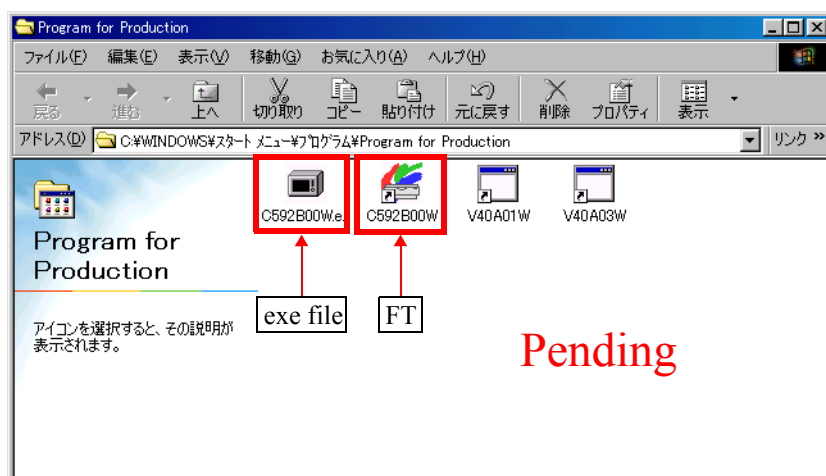
Figure 5-16. Original Adjustment (1)

3. Open the document cover, and place the original adjustment jig as shown in the figure below.
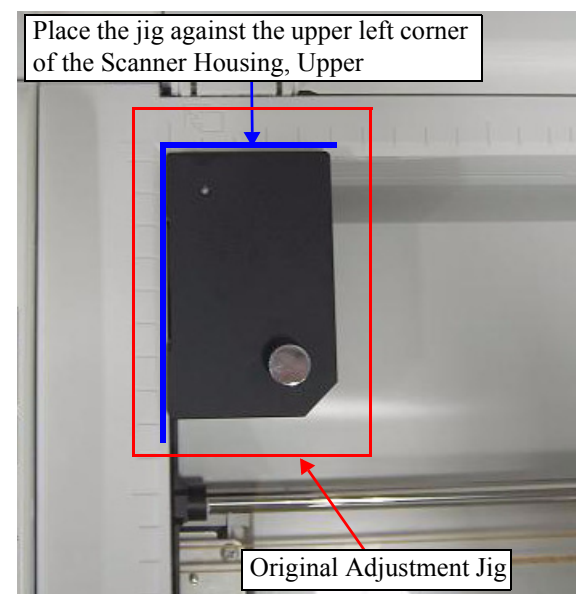
Figure 5-17. Original Adjustment Jig Setting Position

4. Open the FT, select "C592_PRN"on the "Select Parameter Set" window, and click [OK].
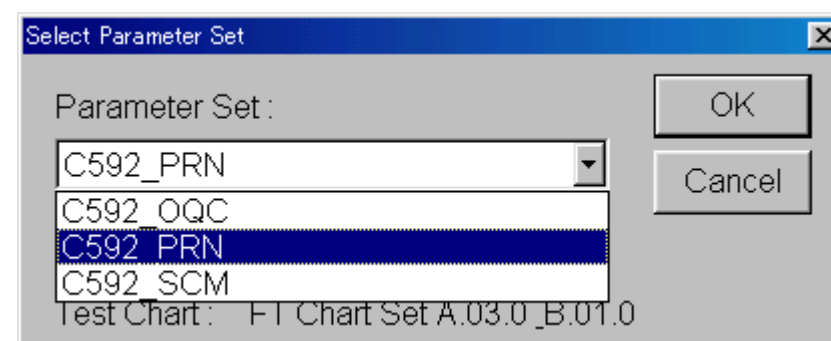
Figure 5-18. Original Adjustment (2)

5. Click the "Single Test" icon on the "EPSON Scanner Function Test - C592B00W" window.
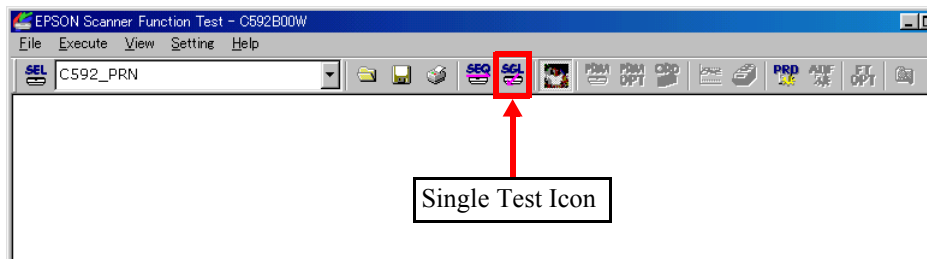
Figure 5-19. Original Adjustment (3)

6. Enter the product number on the "Single Test" window, select "Write Zero Correction Value", and press the [Execute] button.
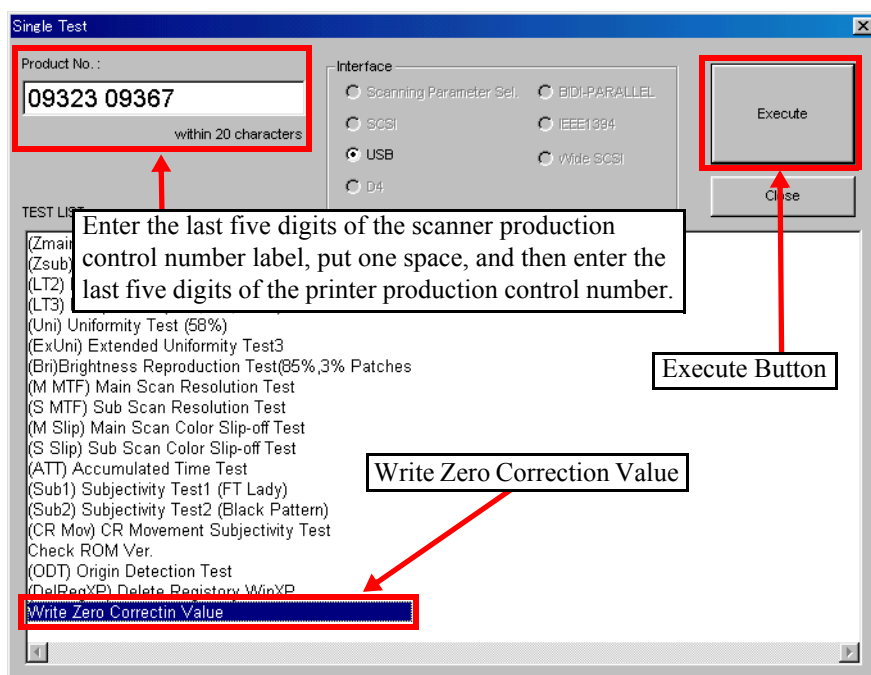
Figure 5-20. Original Adjustment (4)

7. A progress bar will be displayed followed by the window described below.

<Window displayed when the adjustment is completed successfully>
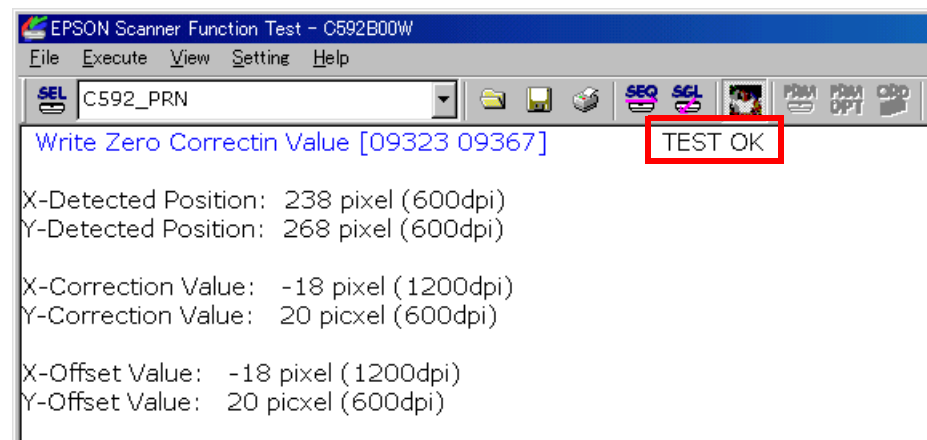
Figure 5-21. Window displayed when the adjustment is completed successfully (1)
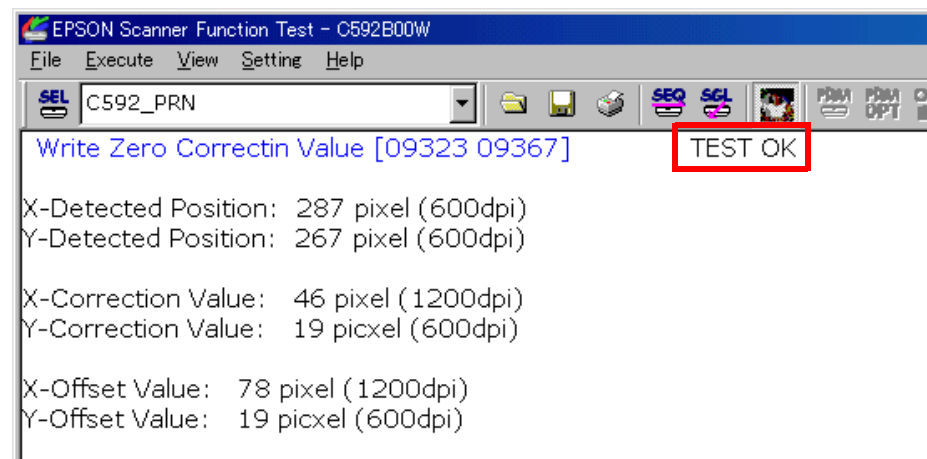
Figure 5-22. Window displayed when the adjustment is completed successfully (2)

<Window displayed when the adjustment is failed>
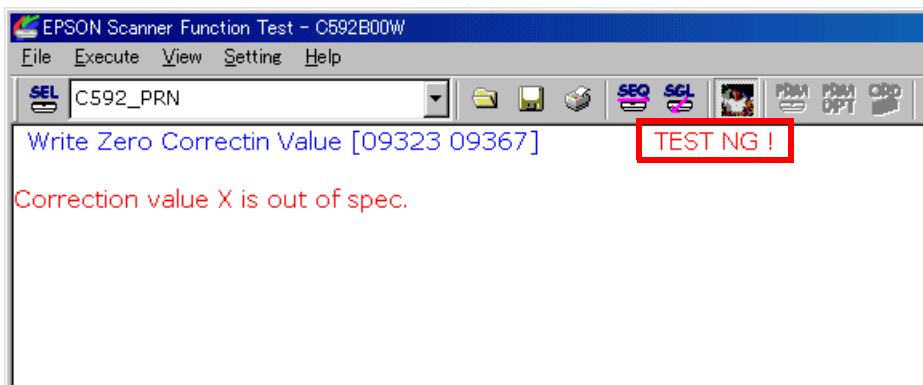
Figure 5-23. Window displayed when the adjustment is failed

If the adjustment could not be completed successfully, check whether the parts are correctly installed or not. If this does not work, perform the part replacement once again.

C H A P T E R

6

MAINTENANCE

6.1 Overview

This section provides information to maintain the printer in its optimum condition.

6.1.1 Cleaning

This printer has no mechanical components which require regular cleaning except the Print Head. Therefore, when returning the printer to the user, check the following parts and perform appropriate cleaning if stain is noticeable.

> **CAUTION**
>
> ❗
>
> - **Never use chemical solvents, such as thinner, benzine, and acetone to clean the exterior parts of the printer like the Housing. These chemicals may deform or deteriorate the components of the printer.**
> - **Be careful not to damage any components when you clean inside the printer.**
> - **Do not scratch the coated surface of the PF Roller Unit. Use soft brush to wipe off any dusts. Use a soft cloth moistened with alcohol to remove the ink stain.**
> - **Do not use cleaning sheet included in the media for normal usage. It may damage the coated surface of PF Roller Unit. If the adhesive surface of the cleaning sheet is set to the LD Roller shaft side and used to clean the LD Roller surface, it is no problem.**
> - **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

☐ Exterior parts
  Use a clean soft cloth moistened with water, and wipe off any dirt. If the exterior parts are stained by the ink, use a cloth moistened with neutral detergent to wipe it off.

☐ Inside the printer
  Use a vacuum cleaner to remove any paper dust.

☐ LD Roller
  When paper loading function does not operate because friction of the LD Roller is lowered by any paper dust, set the adhesive side up of the cleaning sheet (included in the media) to remove any paper dust. Repeat loading the cleaning sheet several times.

☐ Document glass
  Remove dust or any paper with a clean dry cloth. In case dirt is serious or alien substance is stick, wipe it off with a cloth moistened with neutral detergent. In case Stain is remained, wipe again with a dry clean cloth.

6.1.2 Service Maintenance

If any abnormal print (dot missing, white line, etc.) has occurred or the printer indicates the "Maintenance request error" (This error is displayed as "Maintenance call error" in the STM3), take the following actions to clear the error.

☐ Print Head cleaning
  When dot missing or banding phenomenon has occurred, you need to perform the Print Head cleaning operation*1 by using the Print Head cleaning function. This function can be performed by the control panel operation, the printer driver utility and the Adjustment program.
  In case that the cleaning sequence is performed by the control panel operation, confirm that the printer is in stand-by state (the Power LED is lighting), and hold down the Ink SW on the control panel for more than 3 seconds. Then, the printer starts the cleaning sequence (the Power LED blinks during this sequence).
  In case that you select and perform the manual cleaning by the printer driver utility, the most appropriate cleaning mode is selected. The following is the process to perform the Print Head cleaning from the printer driver utility.
  As for the operation of the Adjustment program, refer to Chapter 5 Adjustment.

Note *1: The Stylus CX4700/CX4800/DX4800/DX4850/CX4100/CX4200/DX4200 has three modes for manual cleaning, and even during printing, the appropriate cleaning mode is automatically selected and performed according to various conditions. Therefore the ink consumption amount for manual cleaning varies depending on each mode (Refer to Chapter 2).

1. Select the "EPSON Status Monitor 3" in the printer driver utility, and make sure that the printer is in stand-by state by using the Status monitor 3. If the printer is in stand-by state, the following figure is indicated on the monitor.
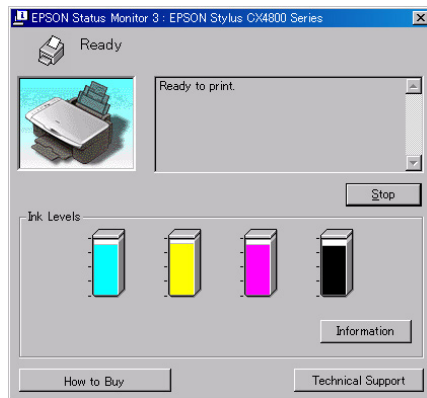
Figure 6-1. Status Monitor 3 Indication

2. Select the "Head Cleaning" in the printer driver utility, and perform the Print Head cleaning. After performing the Print Head cleaning operation, print a nozzle check pattern by selecting the "Nozzle Check". If you repeat the Print Head cleaning operation without selecting the "Nozzle Check", CL1, the weakest cleaning, will be repeated.
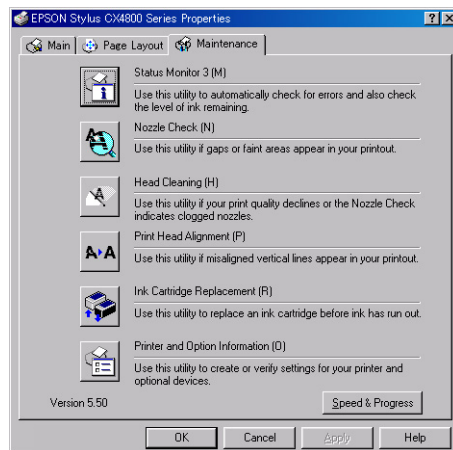
Figure 6-2. Head Cleaning Function in the Printer Driver Utility

☐ Maintenance request error (Maintenance call error)
Ink is used for the Print Head cleaning operation as well as the printing operation. When the ink is used for the Print Head cleaning operation, the ink is drained to the Waste ink pads and the amount of the waste ink is stored as the waste ink counter into the EEPROM on the Main Board. Due to this, when the waste ink counter has reached the limit of the absorbing capability of the Waste ink pads, the Maintenance call error is indicated on Status monitor 3 as following figure.

Figure 6-3. Maintenance error indication in STM3

In this case, replace to new Waste ink pads and clear the waste ink counter stored into the EEPROM. The waste ink counter can be reset only from the Adjustment program because this printer dose not have the waste ink counter reset function by the control panel SW. As for the procedure, refer to Chapter 5 Adjustment.
In your repair activity, check the waste ink counter along with the firmware version, Main Board checker program version and nozzle check pattern on the nozzle check pattern printing. If the waste ink counter is closed to its limit, recommend that the Waste ink pads will be replaced with new one. This is because the "Maintenance request error" will may occur after returning the repaired product to the customer.

6.1.3 Lubrication

The characteristics of the grease have great affects on the mechanical function and durability, especially does the characteristics about temperature environment. The type and amount of the grease used to lubricate the printer parts are determined based on the results of the internal evaluations. Therefore, be sure to apply the specified type and amount of the grease to the specified part of the printer mechanism during servicing.

> **CAUTION** ⚠
>
> ■ **Never use oil or grease other than those specified in this manual. Use of different types of oil or grease may damage the component or give bad influence on the printer function.**
> ■ **Never apply larger amount of grease than specified in this manual.**

Table 6-1. Specified lubricants

Type	Name	EPSON code	Supplier
Grease	G-26	1080614	EPSON
Grease	G-45	1033657	EPSON
Grease	G-71	1304682	EPSON
Grease	G-74	1409257	EPSON

> **CAUTION** ⚠
>
> **When using G-74, it is recommended to use a flux dispenser (1049533) together.**

☐ Refer to the following figures for the lubrication points.

<Lubrication Point> Guide Rail of the Housing, Lower surface
<Lubrication Type> G-45
<Lubrication Amount> 0.06g x 2 points
<Remarks> Use a brush to apply. • Grease should be applied only to the semicircular section.
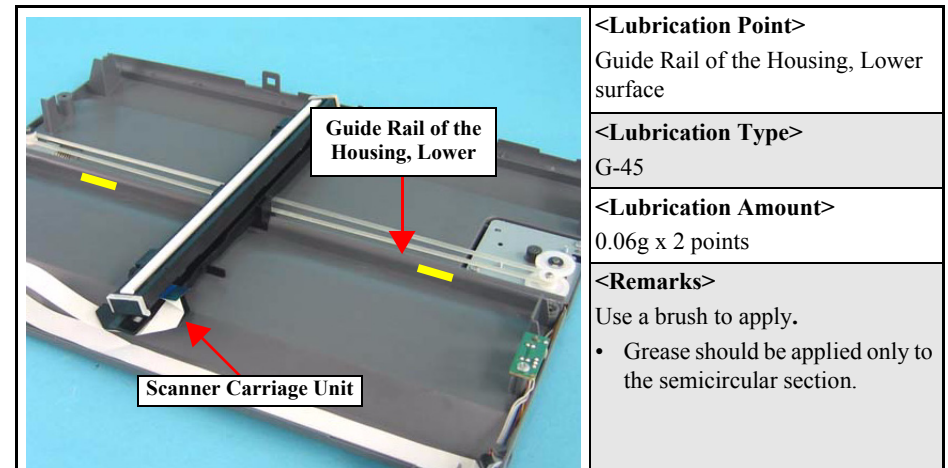
Figure 6-4. Lubrication on Guide Rail of the Housing, Lower Surface

<Lubrication Point> CIS Unit Shaft Hole Sections
<Lubrication Type> G-74
<Lubrication Amount> Adequate dose x 3 points
<Remarks> Use a flux dispenser to apply. • Grease must not be adhered to other parts.
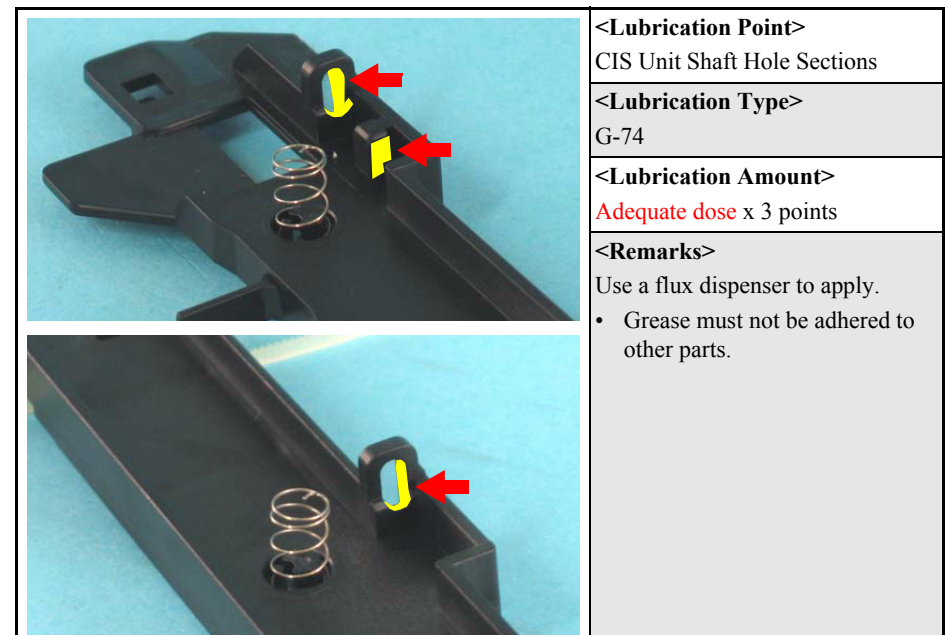
Figure 6-5. Lubrication on CIS Unit Shaft Hole Sections

<Lubrication Point>
1. Paper Back Lever Surface
2. Hopper Surface
<Lubrication Type>
1. G-26
2. G-26
<Lubrication Amount>
φ1 x 1mm
<Remarks>
1. Use a injector to apply.
2. Use a injector to apply.
• Grease must not be adhered to other parts.
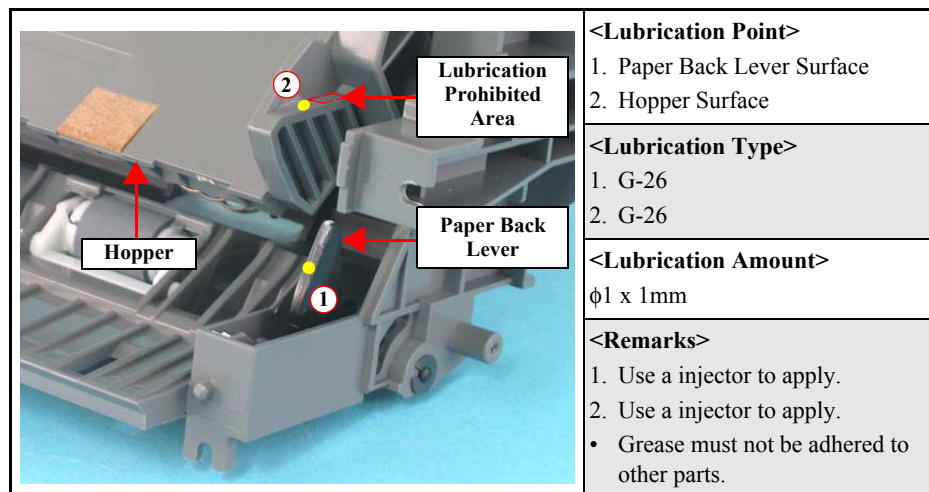
Figure 6-6. Lubrication on ASF Unit

<Lubrication Point>
Cartridge Cover Surface
<Lubrication Type>
G-74
<Lubrication Amount>
0.02g x 1 point
<Remarks>
Use a flux dispenser to apply.
• Grease must not be adhered to other parts.
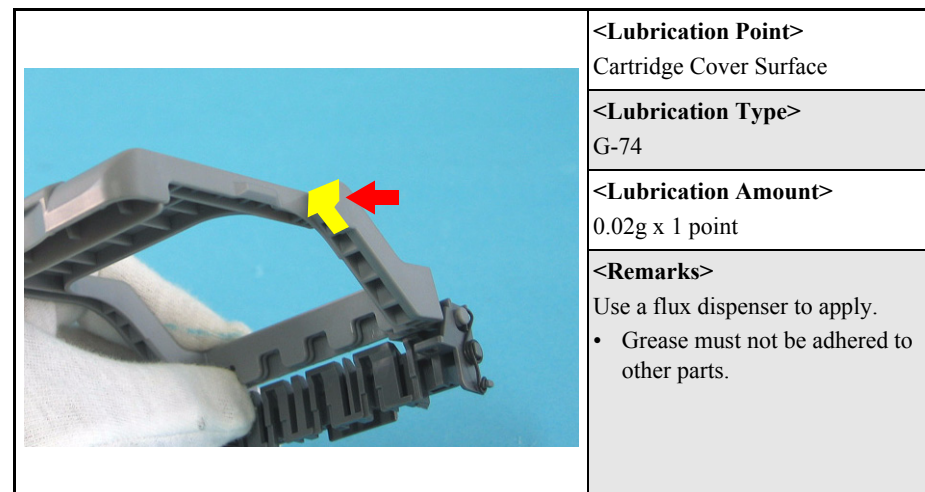
Figure 6-8. Lubrication on Carriage Unit (2)

<Lubrication Point>
1. Two holes of the Carriage Unit. (Should be in touch with the Carriage Guide Shaft.)
2. Carriage Guide Shaft Surface
<Lubrication Type>
1. G-71
2. G-71
<Lubrication Amount>
1. 150 ~ 210mg (Two points in total)
2. 80 ~ 120mg (Two points in total)
<Remarks>
1. Use a injector to apply.
2. Use a injector to apply.
• Do not adhere G-71 to the Timing Belt.
• Do not let G-71 run off to the Carriage outside surface.
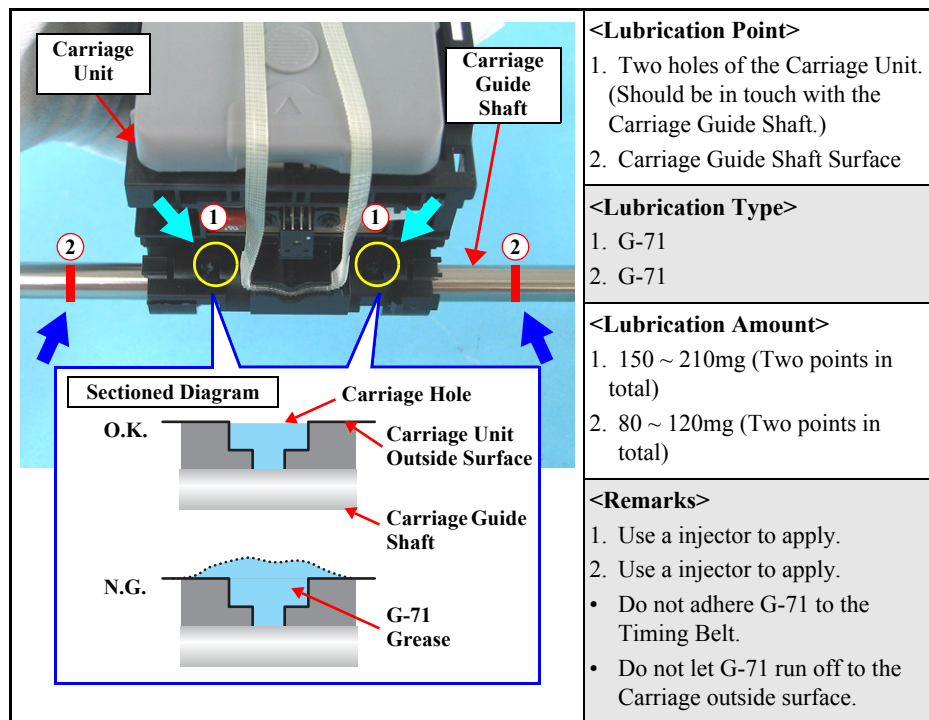
Figure 6-7. Lubrication on Carriage Unit (1)

<Lubrication Point>
Contact areas between the EJ Roller Unit and the five tabs of the Front Paper Guide Support.
<Lubrication Type>
G-74
<Lubrication Amount>
Adequate dose x 5 points
<Remarks>
• Use a flux dispenser to apply.
• Do not adhere G-74 to the rubber part of the EJ Roller Unit.
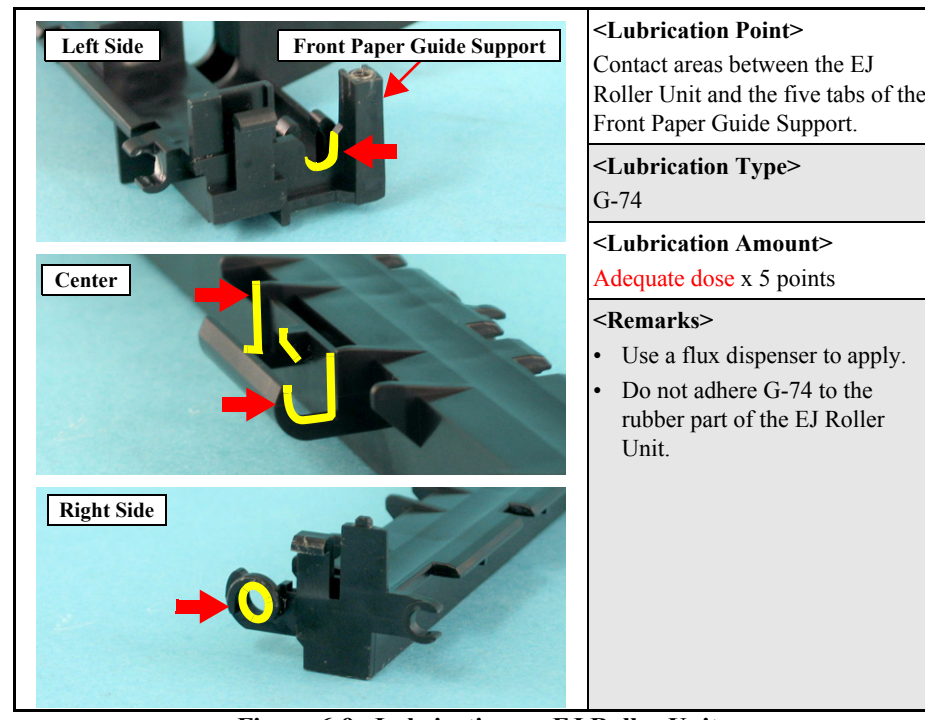
Figure 6-9. Lubrication on EJ Roller Unit

	<Lubrication Point> From the left edge (left line mark) to the right edge (right line mark) of the Front Frame
	<Lubrication Type> KEN Grease
	<Lubrication Amount> 200mg
	<Remarks> Use a injector to apply.
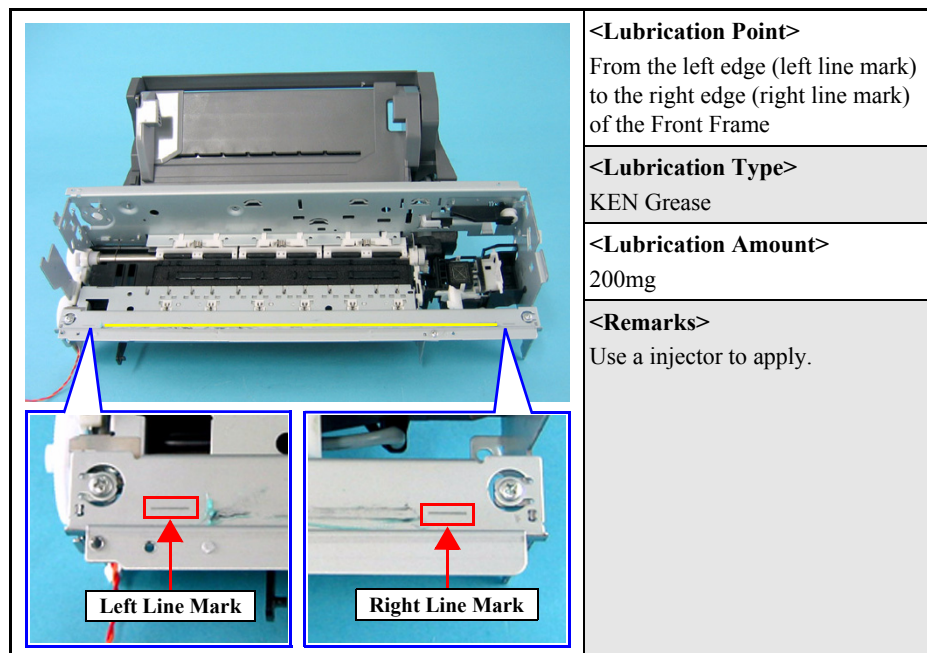
Figure 6-10. Lubrication on Front Frame

	<Lubrication Point> 1. Edge line of the Link Lever (Right) 2. Around two guide pins of the Main Frame (Right)
	<Lubrication Type> 1. G-26 2. G-26
	<Lubrication Amount> 1. φ1 x 1mm 2. φ1 x 2 points
	<Remarks> Use a injector to apply.
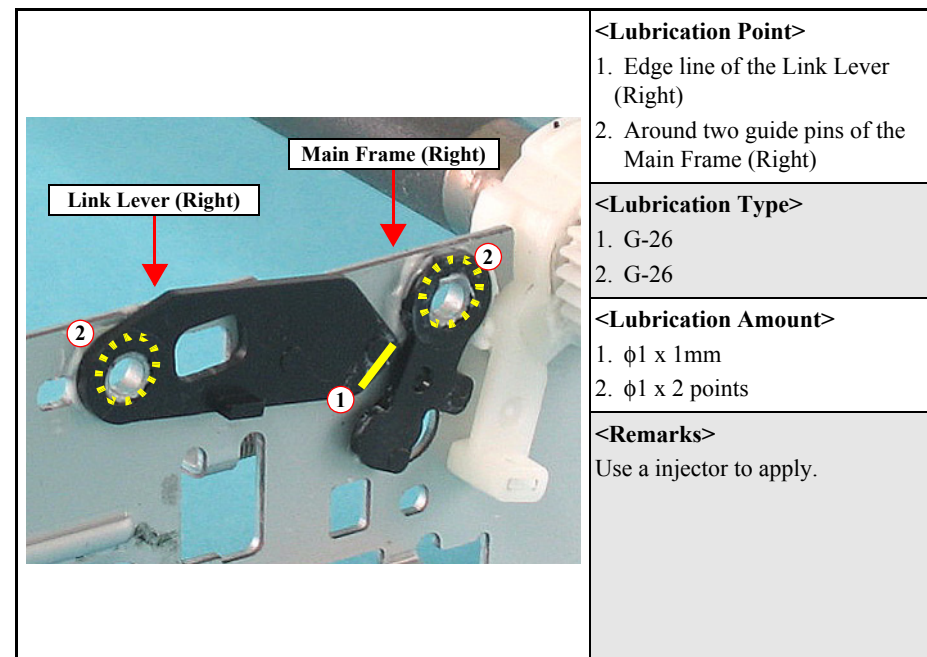
Figure 6-12. Lubrication on Link Lever (Right)

	<Lubrication Point> 1. Edge line of the Link Lever (Left) 2. Around two guide pins of the Link Lever Holder (Left)
	<Lubrication Type> 1. G-26 2. G-26
	<Lubrication Amount> 1. φ1 x 1mm 2. φ1 x 2 points
	<Remarks> Use a injector to apply.
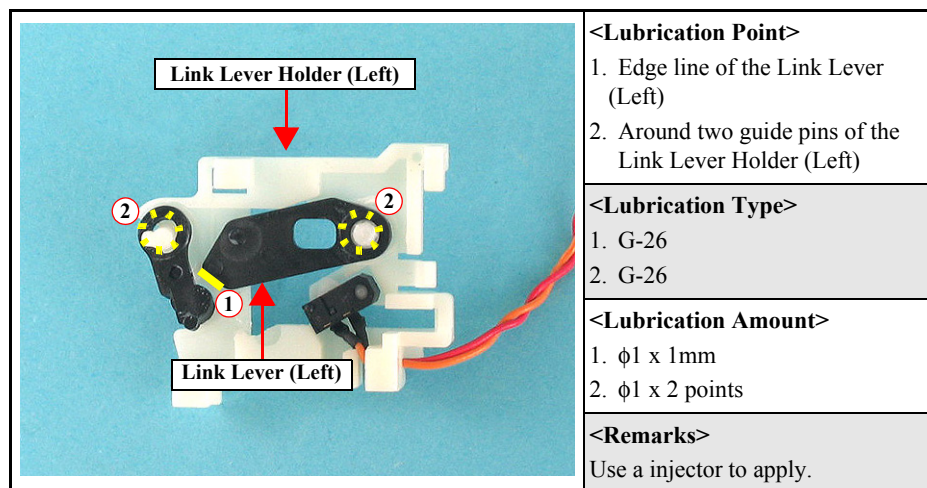
Figure 6-11. Lubrication on Link Lever (Left)

	<Lubrication Point> Contact point between the PF Grounding Spring and the PF Roller Unit
	<Lubrication Type> G-26
	<Lubrication Amount> φ1 x φ of the PF Roller Unit (0.05Gr)
	<Remarks> Use a injector to apply.
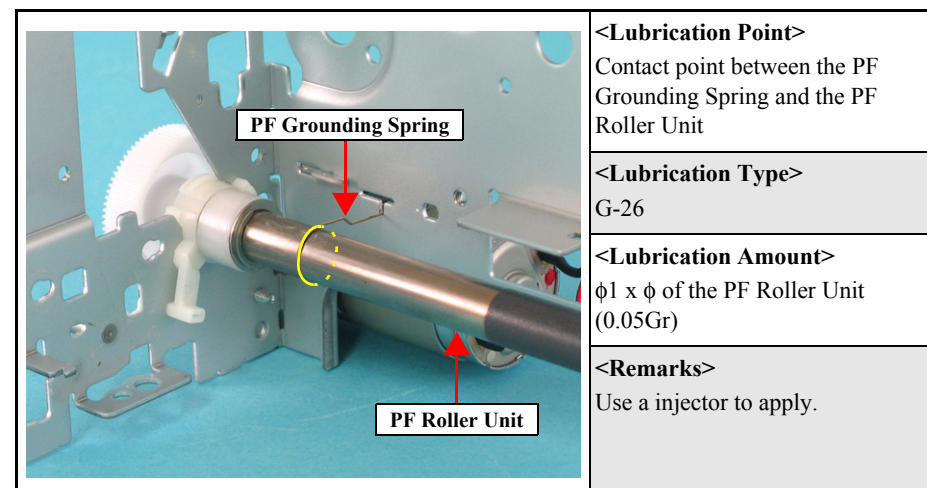
Figure 6-13. Lubrication on PF Roller Unit (1)

	\<Lubrication Point\> Contact point between Bush 10 (Right) and PF Roller Unit
	\<Lubrication Type\> G-26
	\<Lubrication Amount\> $\phi 1 \times \phi$ of the PF Roller Unit
	\<Remarks\> Use a injector to apply. • Do not adhere G-26 to Spool Gear 13.5.
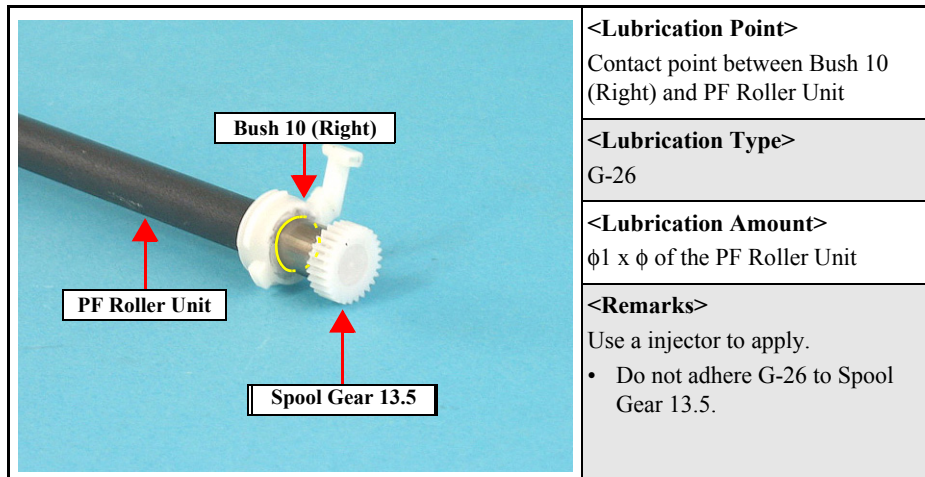
Figure 6-14. Lubrication on PF Roller Unit (2)

APPENDIX

7.1 Connector Summary

7.1.1 Major Component Unit

The major component units of this printer are as follows.

☐ Main Board (C610 Main)

☐ Power Supply Board (C610 PSB/PSE)

☐ Panel Board (C571 PNL/C577 PNL)

The figure below shows how to connect these components.
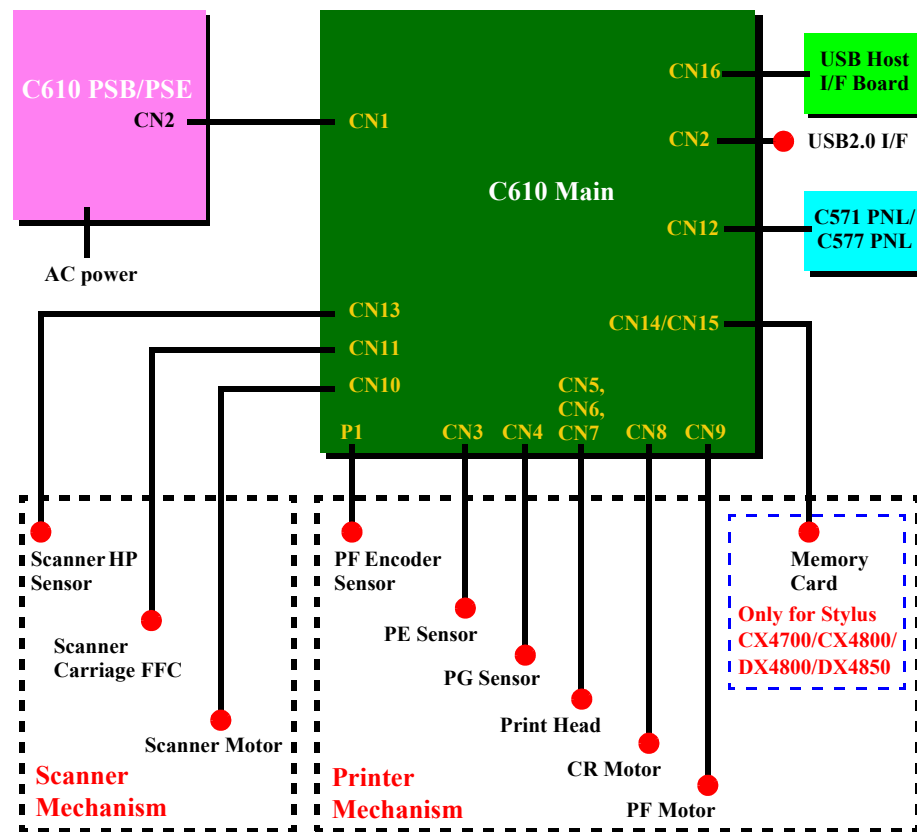
Figure 7-1. Connection of the major components

See the following tables for the connector summary for the C610 Main board and each connectors pin alignment.

Table 7-1. Connector Summary for C610 Main Board

Connector	Function	Table to refer to
CN1	For connection with the Power Supply Board	Table 7-2 (p.195)
CN2	For connection with the USB2.0 interface	"1.3.1 USB Interface" (p.24)
CN3	For connection with the PE Sensor	Table 7-3 (p.196)
CN4	For connection with the PG Sensor	Table 7-4 (p.196)
CN5 to CN7	For connection with the Print Head	Table 7-5 (p.196), Table 7-6 (p.196), Table 7-7 (p.197)
CN8	For connection with the CR Motor	Table 7-8 (p.197)
CN9	For connection with the PF Motor	Table 7-9 (p.197)
CN10	For connection with the Scanner Motor	Table 7-10 (p.197)
CN11	For connection with the Scanner Carriage FFC	Table 7-11 (p.197)
CN12	For connection with the Panel Board	Table 7-12 (p.198)
CN13	For connection with the Scanner HP Sensor	Table 7-13 (p.198)
CN14/CN15	For connection with the Memory Card	Table 7-14 (p.198), Table 7-15 (p.199)
CN16	For connection with the USB Host I/F Board	Table 7-16 (p.200)

Table 7-2. CN1 - Power Supply Board

Pin	Signal Name	I/O	Function
1	+42V	—	+42V
2	GND	—	Ground
3	PSC	I	Power supply control

Table 7-3. CN3 - PE Sensor

Pin	Signal Name	I/O	Function
1	PE	I	PE Sensor signal
2	GND	—	Ground
3	PEV	—	Power supply for PE Sensor

Table 7-4. CN4 - PG Sensor

Pin	Signal Name	I/O	Function
1	PG	I	PG Sensor signal
2	GND	—	Ground

Table 7-5. CN5 - Print Head

Pin	Signal Name	I/O	Function
1	XHOT/THM	I	Head temperature signal
2	SI2_Ma	O	Print data output for Magenta nozzles
3	VDD2	—	+3.3V
4	SI1_Ye	O	Print data output for Yellow nozzles
5	GND	—	Ground
6	NCHG	O	All nozzle fire selection pulse
7	GND	—	Ground
8	LAT	O	Head data latch pulse output
9	NC	—	Not connected
10	GND2	—	Ground
11	COM	O	Head drive pulse (trapezoid waveform)
12	GND2	—	Ground
13	COM	O	Head drive pulse (trapezoid waveform)

Table 7-6. CN6 - Print Head

Pin	Signal Name	I/O	Function
1	GND2	—	Ground
2	COM	O	Head drive pulse (trapezoid waveform)
3	GND2	—	Ground
4	COM	O	Head drive pulse (trapezoid waveform)
5	VHV	O	+42V power supply for nozzle selector
6	GND	—	Ground
7	SCK	—	Serial clock
8	GND	—	Ground
9	CH	O	Charge signal for the trapezoidal wave-form
10	VDD	—	+3.3V
11	SI3_Cy	O	Print data output for cyan nozzles
12	GND	—	Ground
13	SI4_Bk	O	Print data output for black nozzles

Table 7-7. CN7 - Print Head

Pin	Signal Name	I/O	Function
1	COI	I	Cartridge detect signal
2	CSDA	I/O	CSIC transmit and receive data
3	CRST	O	Reset signal for address counter of CSIC
4	GND2	—	Ground
5	CVDD	O	Power supply for CSIC
6	CSCK	I/O	Clock signal for CSIC read/write
7	NC	—	Not connected
8	GND	—	Ground
9	ENCB	I	Encoder feed back signal ch.B
10	EVDD	O	Power for CR Encoder
11	ENCA	I	Encoder feed back signal ch.A
12	NC	—	Not connected
13	PW	I	PW Sensor signal
14	GND	—	Ground
15	LEDON	—	Power supply for PW sensor

Table 7-8. CN8 - CR Motor

Pin	Signal Name	I/O	Function
1	CR-A	O	CR Motor drive signal (A)
2	CR-B	O	CR Motor drive signal (B)

Table 7-9. CN9 - PF Motor

Pin	Signal Name	I/O	Function
1	PF-A	O	PF Motor drive signal (A)
2	PF-B	O	PF Motor drive signal (B)

Table 7-10. CN10 - Scanner Motor

Pin	Signal Name	I/O	Function
1	B	O	Phase drive signal (-A)
2	AX	O	Phase drive signal (B)
3	A	O	Phase drive signal (A)
4	BX	O	Phase drive signal (-B)

Table 7-11. CN11 - Scanner Carriage

Pin	Signal Name	I/O	Function
1	OS	O	Output signal
2	VAD	—	Power supply for filtered 5V_SW (analog)
3	GND	—	Ground
4	M	O	Clock
5	RS	O	Reset
6	TR	O	Shift pulse
7	GND	—	Ground
8	VDD	—	Power supply for 5V_SW (digital)
9	LED R	O	LED cathode (Red)
10	LED G	O	LED cathode (Green)
11	LED B	O	LED cathode (Blue)
12	LED CA	—	Power supply for LED

Table 7-12. CN12 - Panel Board

Pin	Signal Name	I/O	Function
1	GND	—	Ground
2	+3.3 V	—	+3.3 V
3	SDO	O	Serial data output for LED control
4	PSW	I/O	TBD
5	CLK	O	Shift clock for serial data I/O
6	SLAT	O	Switch data load signal and LED data latch signal
7	SENB	O	LED lamp enable signal
8	SDI	I	Switch data serial data input

Table 7-13. CN13 - Scanner HP Sensor

Pin	Signal Name	I/O	Function
1	SCN_HP	I	Scanner HP Sensor signal
2	GND	—	Ground
3	PEV	—	Power supply for Scanner HP Sensor

Table 7-14. CN14 - Memory Card

Pin	Signal Name	I/O	Function
1	GND	—	Ground
2	CD3		Data bus for CF slot (3)
3	CD4		Data bus for CF slot (4)
4	CD5		Data bus for CF slot (5)
5	CD6		Data bus for CF slot (6)
6	CD7		Data bus for CF slot (7)
7	/CE1		Card enable signal
8	CA10		Address bus for CF slot (10)

Table 7-14. CN14 - Memory Card

Pin	Signal Name	I/O	Function
9	/OE		Output enable signal
10	CA9		Address bus for CF slot (9)
11	CA8		Address bus for CF slot (8)
12	CA7		Address bus for CF slot (7)
13	VCC	—	Power supply for CompactFlash
14	CA6		Address bus for CF slot (6)
15	CA5		Address bus for CF slot (5)
16	CA4		Address bus for CF slot (4)
17	CA3		Address bus for CF slot (3)
18	CA2		Address bus for CF slot (2)
19	CA1		Address bus for CF slot (1)
20	CA0		Address bus for CF slot (0)
21	CD0		Data bus for CF slot (0)
22	CD1		Data bus for CF slot (1)
23	CD2		Data bus for CF slot (2)
24	WP/IOIS16B		Write protect - I/O port 16 bit
25	/CD2		Card detect signal
26	/CD1		Card detect signal
27	CD11		Data bus for CF slot (11)
28	CD12		Data bus for CF slot (12)
29	CD13		Data bus for CF slot (13)
30	CD14		Data bus for CF slot (14)
31	CD15		Data bus for CF slot (15)
32	/CE2		Card enable signal
33	NC/VS1		Voltage sensing 1

Table 7-14. CN14 - Memory Card

Pin	Signal Name	I/O	Function
34	/IORD		I/O read
35	/IOWR		I/O write
36	/WE		Write enable signal
37	RDY		Ready
38	VCC	—	Power supply for CompactFlash
39	/CSEL	—	Not connected
40	RPU/VS2		Voltage sensing 2
41	RESET		Reset
42	/WAIT		Bus cycle extension
43	INPACK		Input port response
44	/REG		Register select
45	BVD2/SPKA		Battery voltage detect/audio digital waveform
46	BVD1/STSCHG		Battery voltage detect/card status change
47	CD8		Data bus for CF slot (8)
48	CD9		Data bus for CF slot (9)
49	CD10		Data bus for CF slot (10)
50	GND	—	Ground

Table 7-15. CN15 - Memory Card

Pin	Signal Name	I/O	Function
1	CD		TBD
2	WP		TBD
3	GND	—	Ground
4	SW_GND	—	Ground
5	VCC	—	Power supply for SSFDC

Table 7-15. CN15 - Memory Card

Pin	Signal Name	I/O	Function
6	DETECT		TBD
7	CD1	—	TBD
8	GND	—	Ground
9	FD4		SSFDC data (Bit 4)
10	DAT1		Data Line (Bit 1)
11	GND	—	Ground
12	DAT0		Data Line (Bit 0)
13	FD5		SSFDC data (Bit 5)
14	GND	—	Ground
15	FD3		SSFDC data (Bit 3)
16	CLK		Clock
17	FD6		SSFDC data (Bit 6)
18	FLVD		Low Voltage Detect
19	FD2		SSFDC data (Bit 2)
20	BS		Serial protocol bus state signal
21	FD7		SSFDC data (Bit 7)
22	Reserve	—	Not connected
23	FD1		SSFDC data (Bit 1)
24	SDIO		Serial protocol data signal
25	Reserve	—	Not connected
26	FD0		SSFDC data (Bit 0)
27	XD_CD2		Card detect signal
28	GND	—	Ground
29	GND	—	Ground
30	INS		Serial protocol data signal

Table 7-15. CN15 - Memory Card

Pin	Signal Name	I/O	Function
31	FWPB		Write protect signal
32	Reserve	—	Not connected
33	FRDY		Ready
34	SCLK		Stick inserted/removed detect terminal
35	FWEB		Write enable signal
36	VCC	—	Power supply for SmartMedia
37	FOEB		Output enable signal
38	GND	—	Ground
39	FALE		Address latch enable signal
40	VDD	—	Power supply for SD Memory Card
41	FCEB		Chip enable signal
42	—	—	Ground
43	FCLE		Command latch enable signal
44	CMD		Command/Response
45	VCC	—	Power supply for SmartMedia
46	CD/DAT3		Card Detect /Data Line (Bit 3)
47	GND	—	Ground
48	DAT2		Data Line (Bit 2)
49	WP1		Write protect seal condition

Table 7-16. CN16-USB Host I/F Board

Pin	Signal Name	I/O	Function
1	VBUS_IN	—	USB VBUS Input
2	D-	Bi-D	USB D- Signal
3	D+	Bi-D	USB D+ Signal
4	GND	—	Ground

7.2 Exploded Diagram

Following pages show exploded diagram.

EPSON   PX-A650
Stylus CX4700/CX4800/DX4800/DX4850

Rev.01   C610-CASE-001

Figure 7-2. PX-A650/Stylus CX4700/CX4800/DX4800/DX4850 Exploded Diagram 1

EPSON   PX-A650
      Stylus CX4700/CX4800/DX4800/DX4850

Rev.01   C610-CASE-002

Figure 7-3. PX-A650/Stylus CX4700/CX4800/DX4800/DX4850 Exploded Diagram 2

EPSON   PX-A650
        Stylus CX4700/CX4800/DX4800/DX4850

Rev.01   C610-ELEC-001

Figure 7-4. PX-A650/Stylus CX4700/CX4800/DX4800/DX4850 Exploded Diagram 3
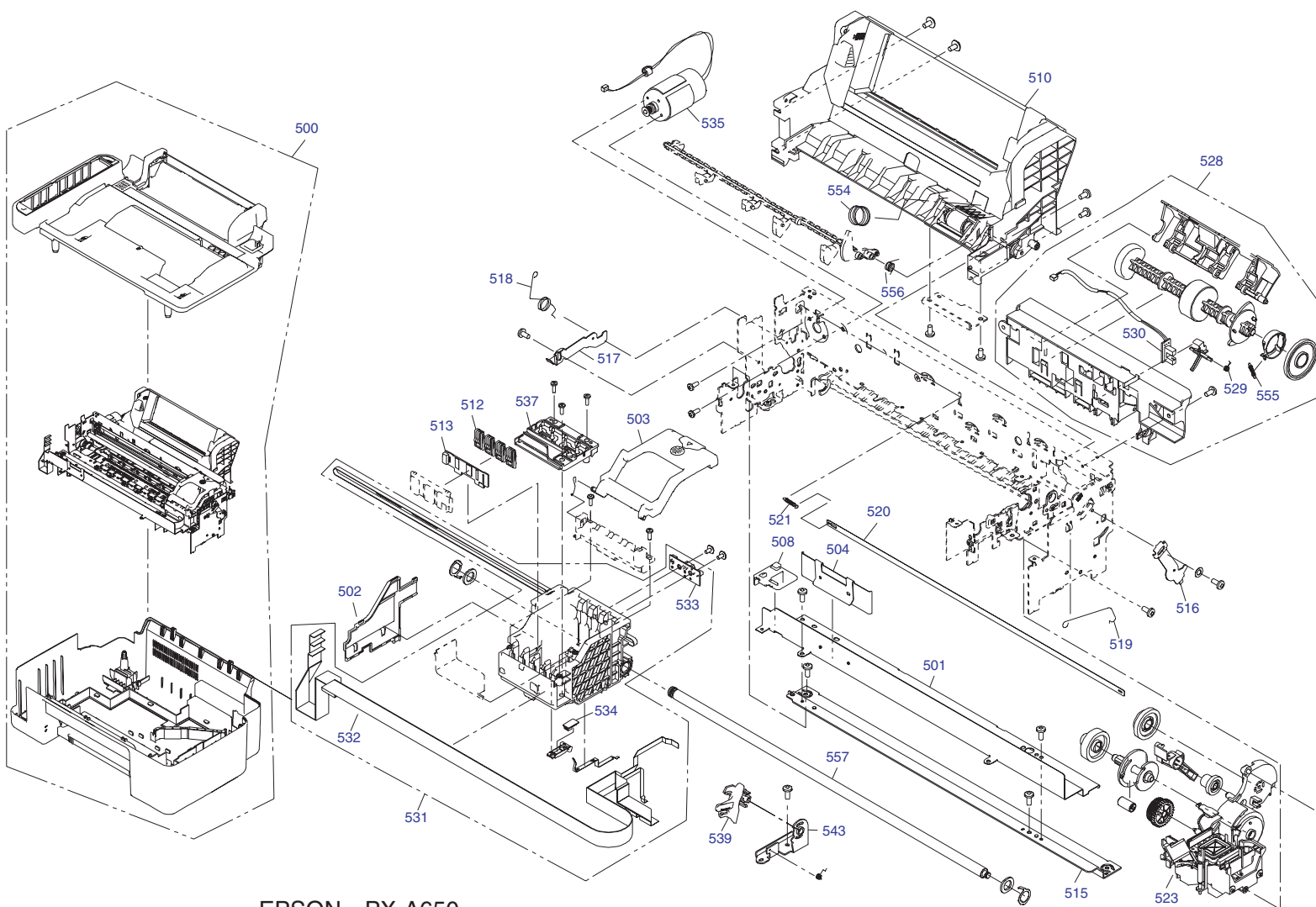
EPSON   PX-A650
Stylus CX4700/CX4800/DX4800/DX4850   Rev.01   C610-MECH-001
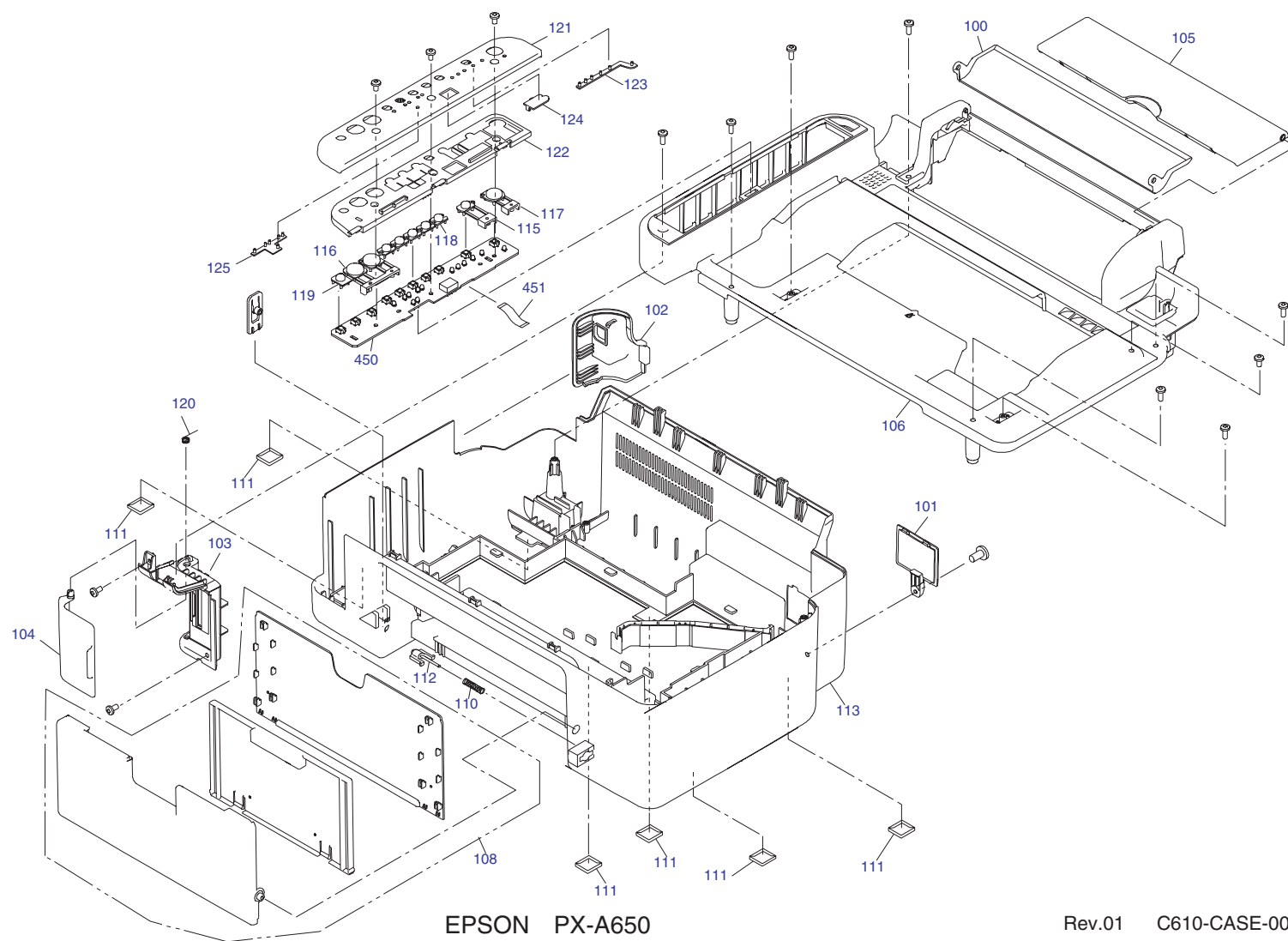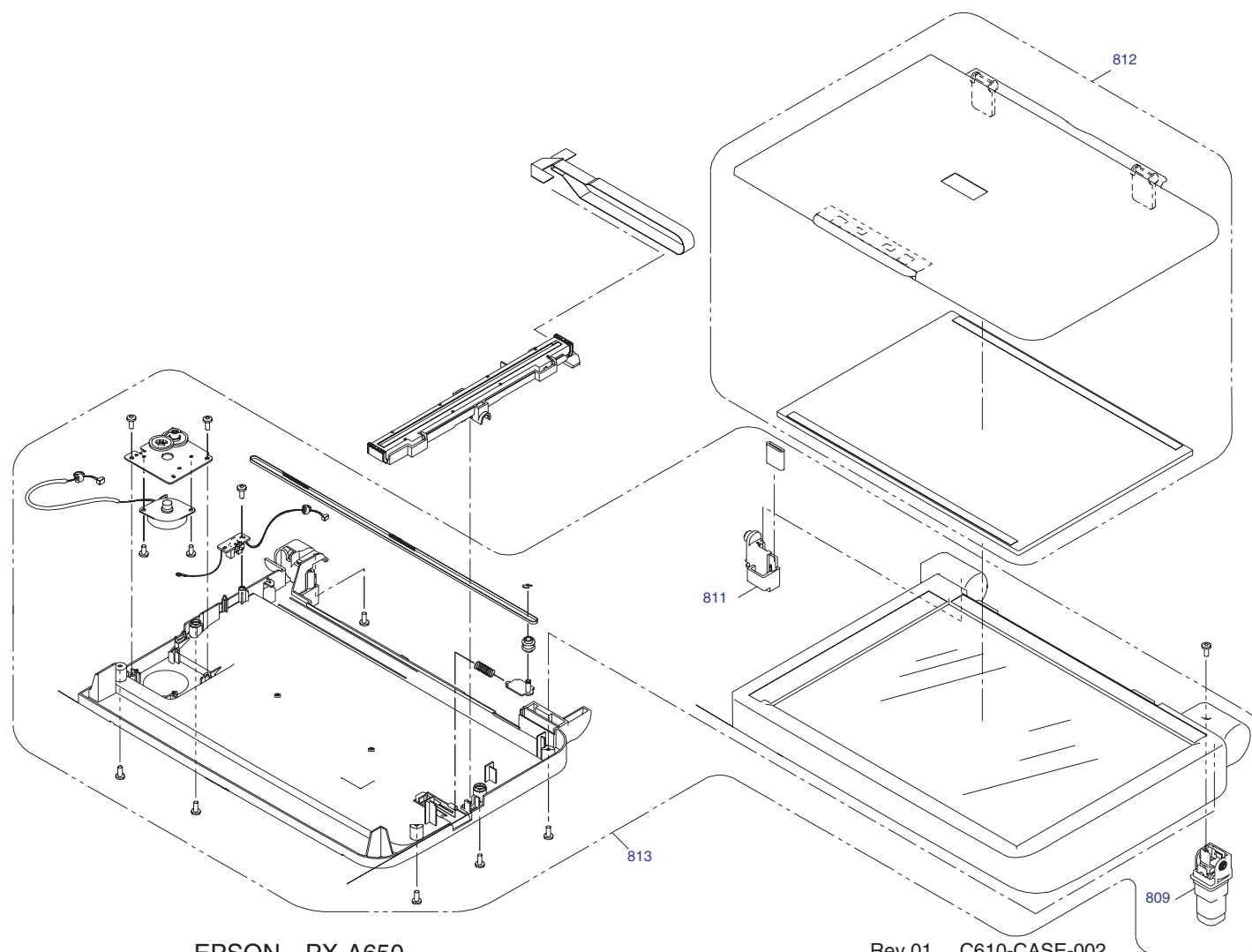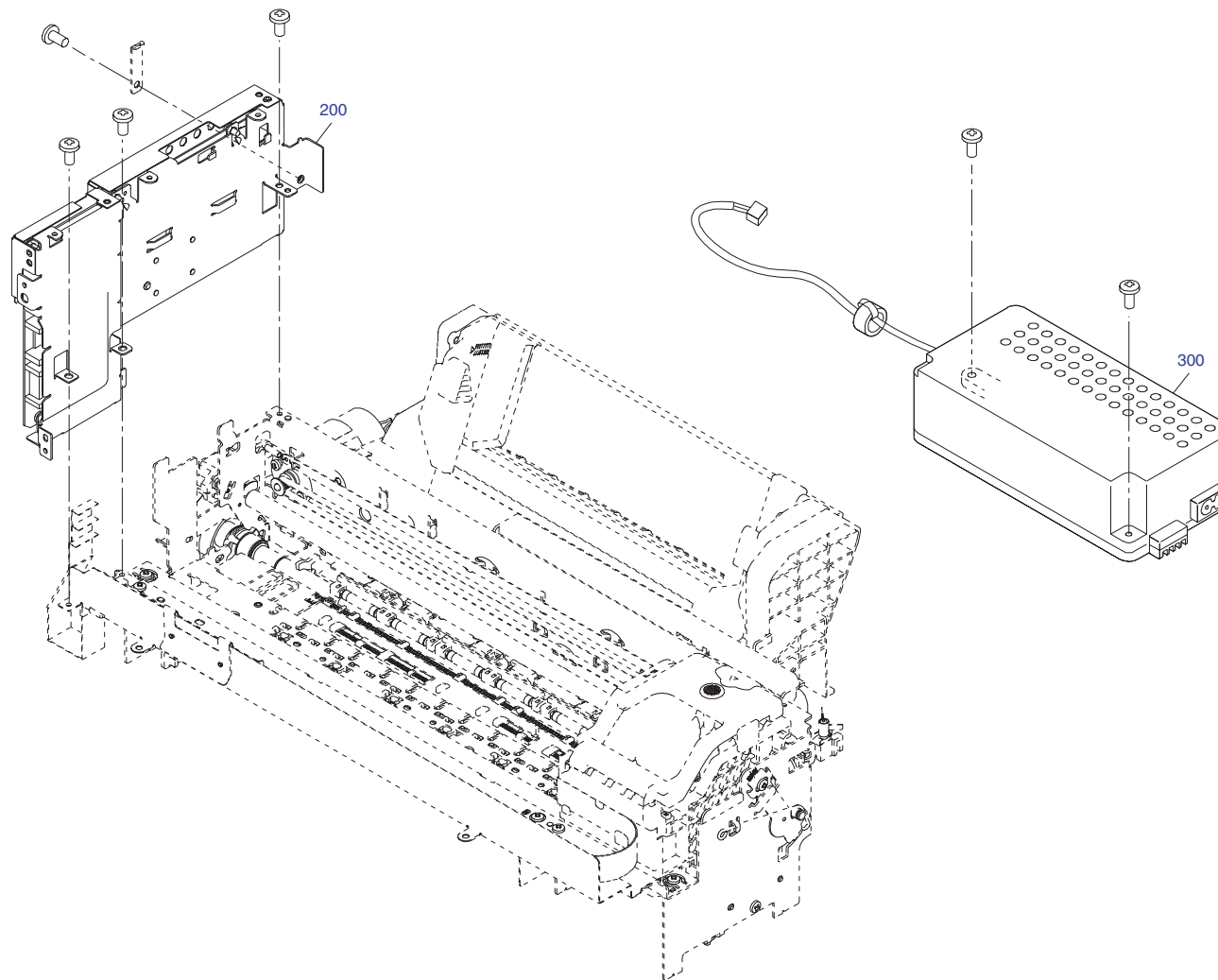
Figure 7-5. PX-A650/Stylus CX4700/CX4800/DX4800/DX4850 Exploded Diagram 4

EPSON   PX-A650
Stylus CX4700/CX4800/DX4800/DX4850   Rev.01   C610-MECH-002
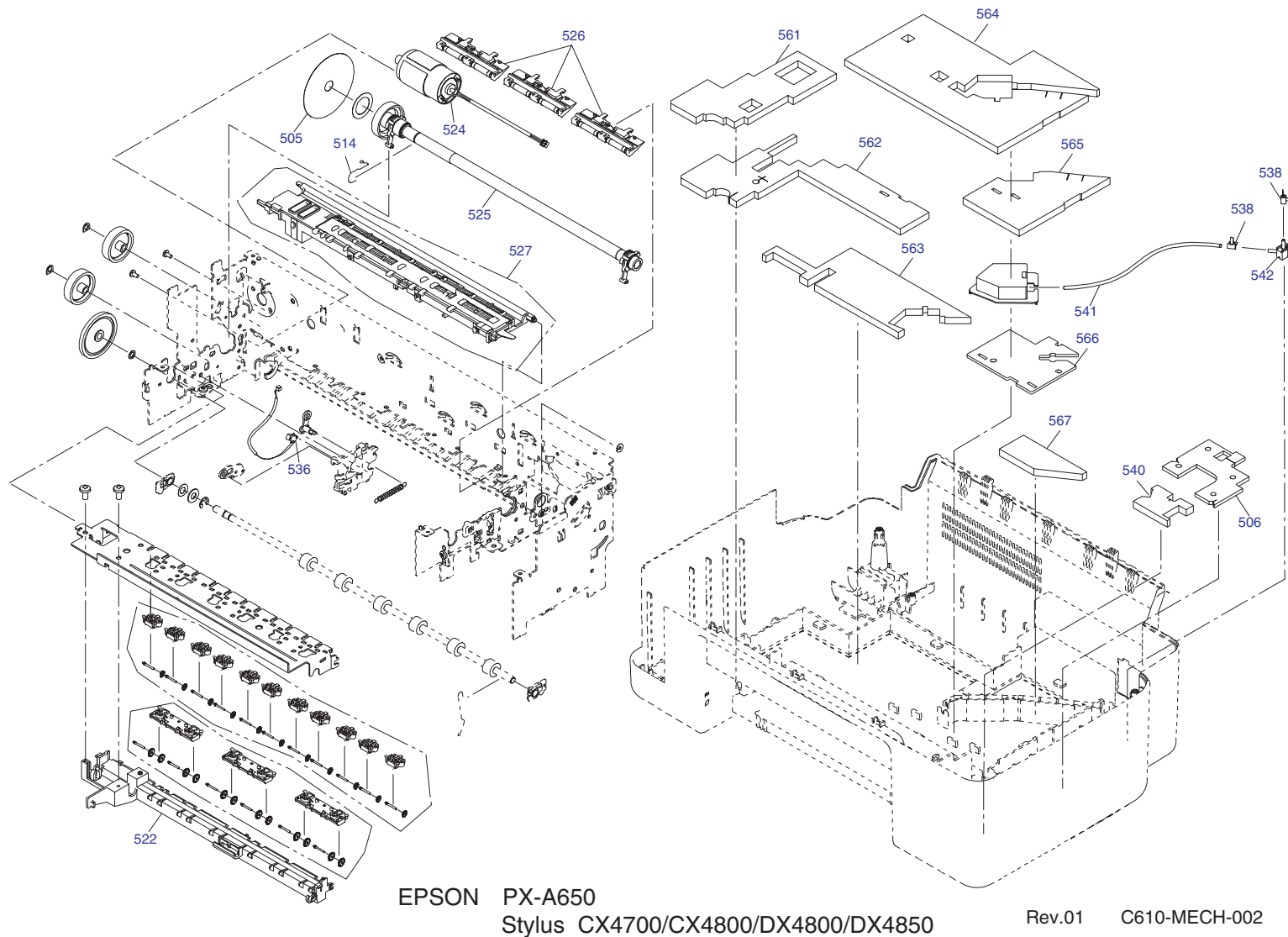
Figure 7-6. PX-A650/Stylus CX4700/CX4800/DX4800/DX4850 Exploded Diagram 5
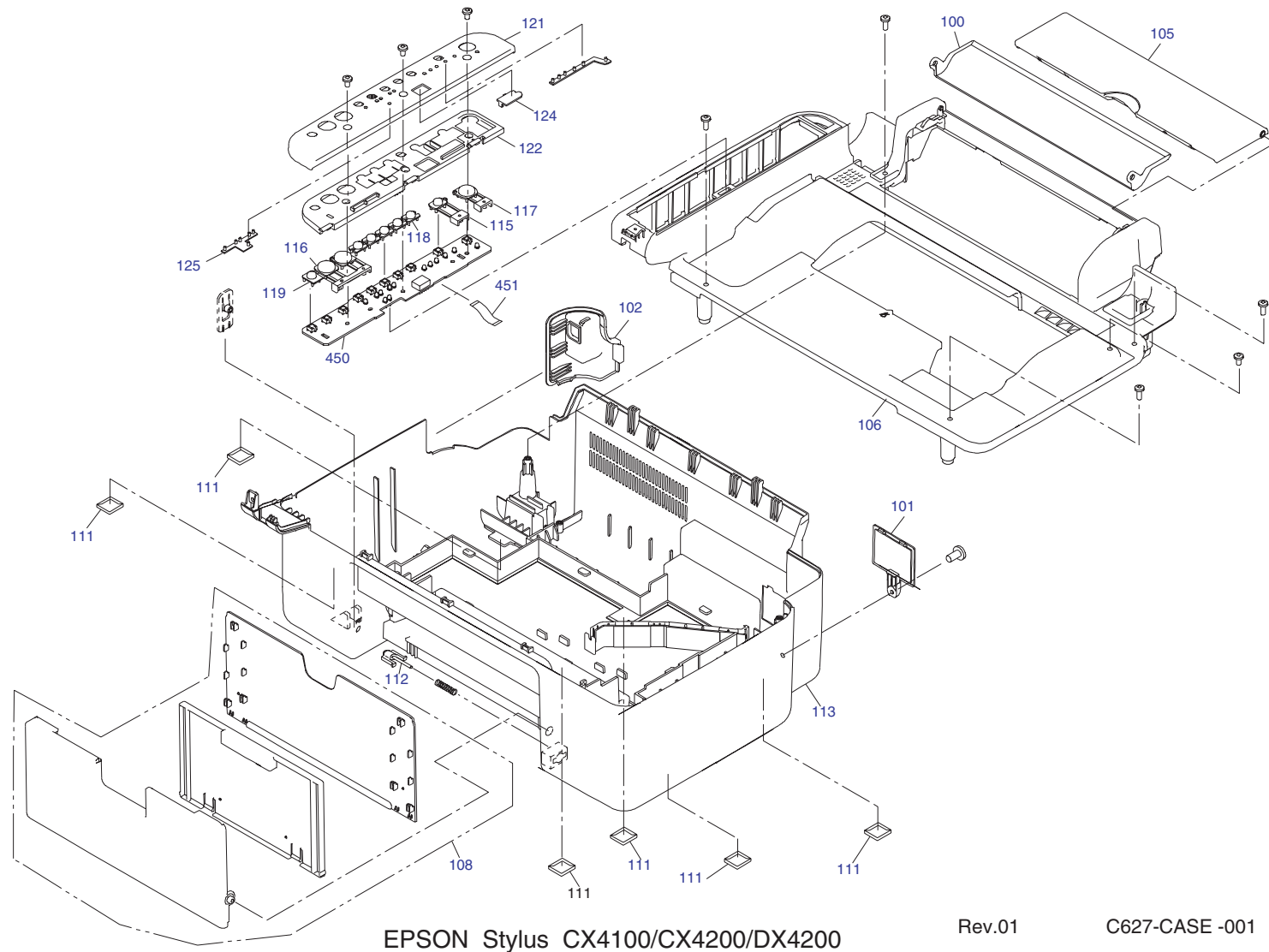
EPSON Stylus CX4100/CX4200/DX4200   Rev.01   C627-CASE -001

Figure 7-7. Stylus CX4100/CX4200/DX4200 Exploded Diagram 6
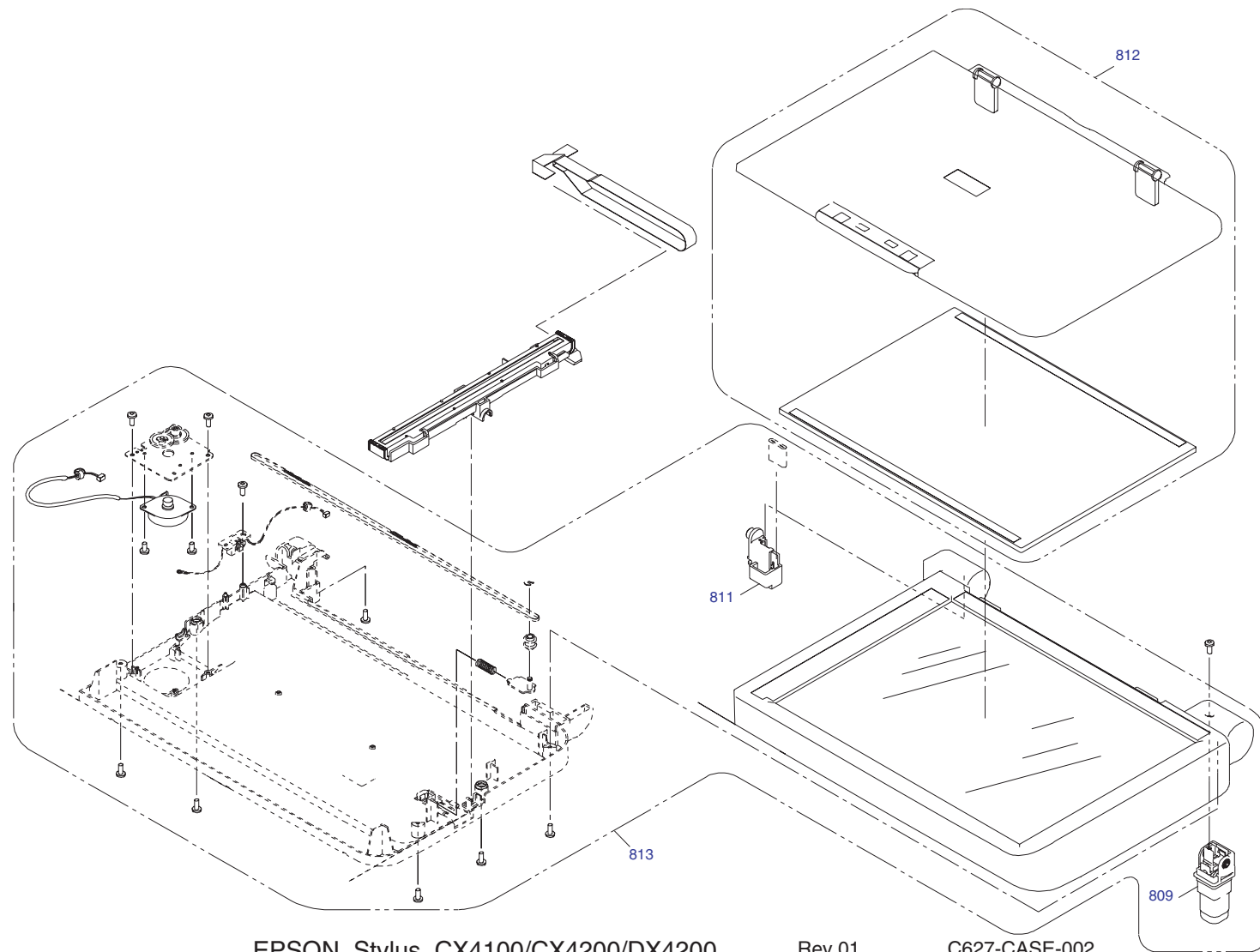
EPSON Stylus CX4100/CX4200/DX4200   Rev.01   C627-CASE-002

Figure 7-8. Stylus CX4100/CX4200/DX4200 Exploded Diagram 7

EPSON Stylus CX4100/CX4200/DX4200   Rev.01   C627-ELEC-001

Figure 7-9. Stylus CX4100/CX4200/DX4200 Exploded Diagram 8

EPSON Stylus CX4100/CX4200/DX4200   Rev.01   C627-MECH-001

Figure 7-10. Stylus CX4100/CX4200/DX4200 Exploded Diagram 9

EPSON Stylus CX4100/CX4200/DX4200

Rev.01   C627-MECH-002

Figure 7-11. Stylus CX4100/CX4200/DX4200 Exploded Diagram 10

7.3 Parts List
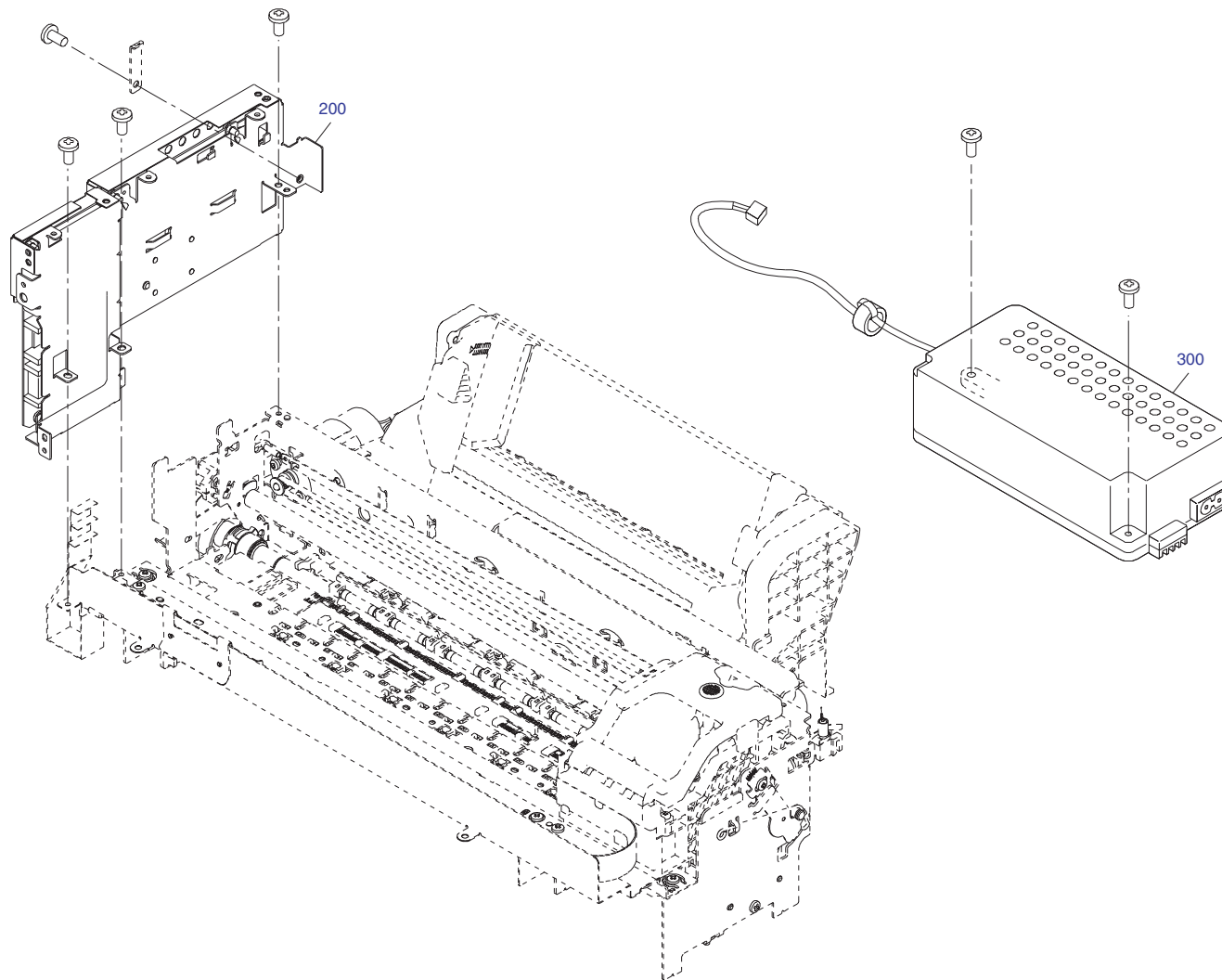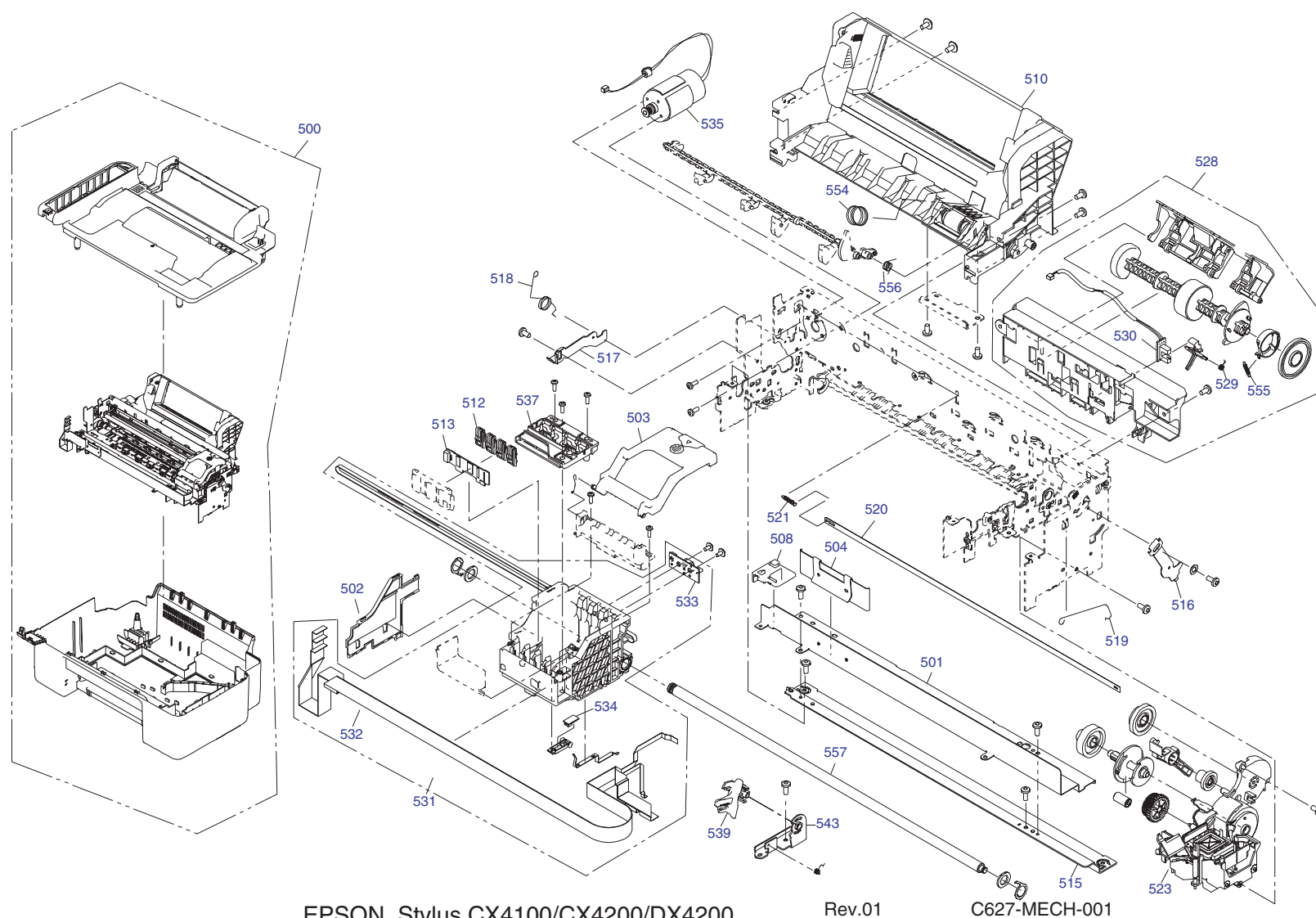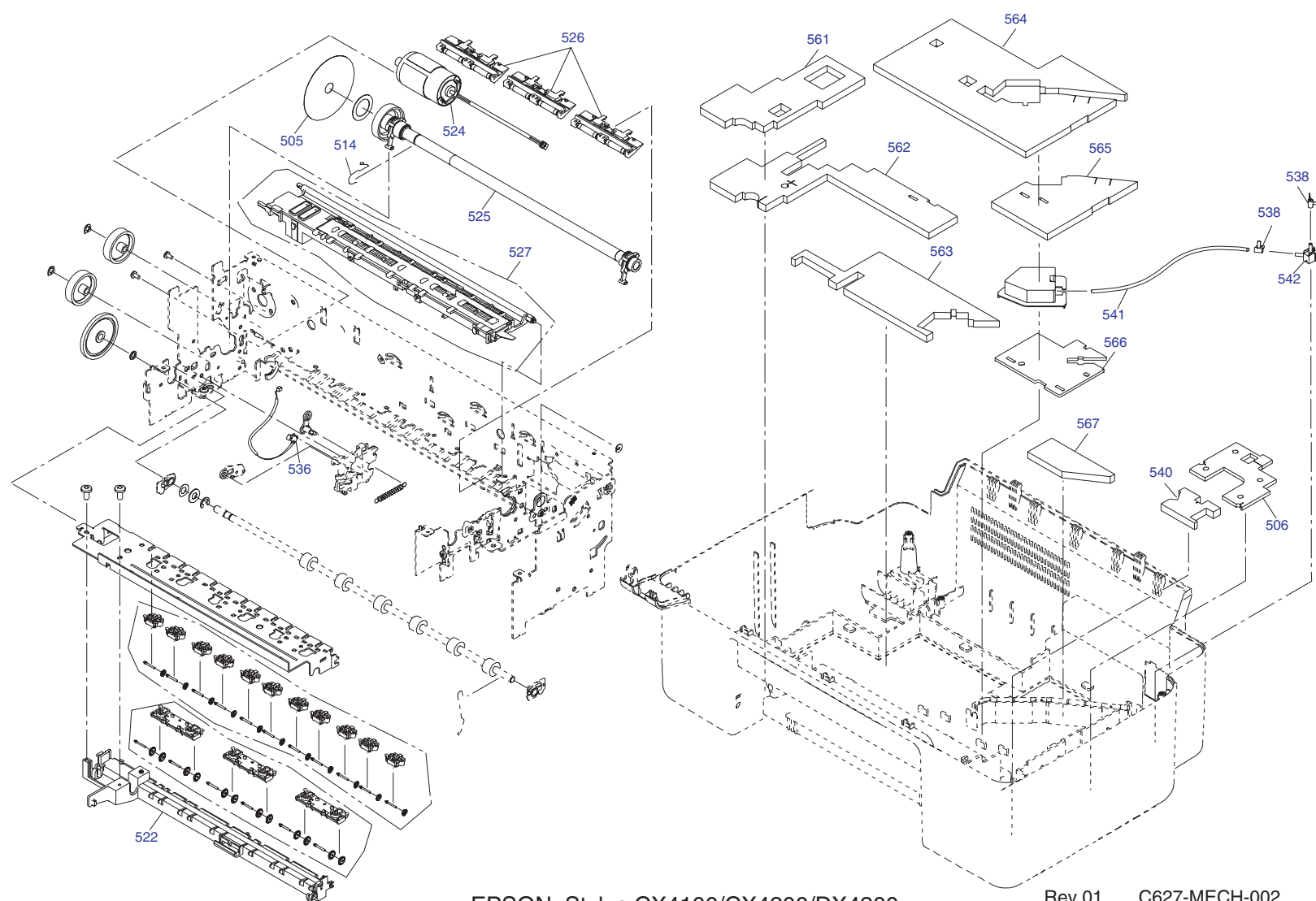
☐ Parts list for EPSON Stylus CX4700/CX4800/DX4800/DX4850

Code	Parts Name
100	COVER,ASF
101	COVER,REAR;EDG2
102	COVER,USB;EDG2
103	HOUSING,CARD SLOT;EDG2
104	COVER,CARD SLOT;B;EFS
105	PAPER SUPPORT ASSY.
106	HOUSING,UPPER,EDG2
108	STACKER ASSY.;EDG2
110	COMPRESSION SPRING,5.1
111	FOOT
112	LOCK,STACKER
113	HOUSING,LOWER,EDG2
115	BUTTON,INK;B
116	BUTTON,COPY;B;EGM
117	BUTTON,POWER;B;EBM
118	BUTTON,S
119	BUTTON,STOP
120	SPRING,COVER,CARD SLOT;B
121	DECORATION PLATE,H.PANEL;B;ENM3;TEXT;LTR
122	HOUSING,PANEL;C
123	OPTICAL TUBE,PANEL,UPPER
124	COVER,LED
125	OPTICAL TUBE,PANEL,LOWER
450	BOARD ASSY.,PANEL
809	HINGE,ASSY.
811	HINGE,L

Code	Parts Name
812	COVER,DOCUMENT ASSY.,CX4800
813	SCANNER ASSY.;EDG2
NON FIG	LABEL,INK,POSITION
200	MAIN BOARD ASSY.
300	POWER SUPPLY UNIT;100V
500	PRINTER MECHANISM(ASP)MAO10-101
501	FRAME,FRONT;B
502	COVER,CABLE,HEAD
503	COVER,CARTRIDGE;EPG2
504	FRAME,HOLDER,FFC
505	SCALE,PF;B
506	POROUS PAD,CAP,LOWER
508	GUIDE,FFC
510	ASF UNIT;B
512	CONNECTER,CSIC
513	BOARD ASSY.,CSIC
514	GROUNDING SPRING,PF
515	FRAME,GUIDE,CR
516	LEVER,PARALLEL ADJUSTMENT,RIGHT
517	LEVER,PARALLEL ADJUSTMENT,LEFT
518	TORSION SPRING,SHAFT,CR,GUIDE
519	PRESSING SPRING,SHAFT,CR,GUIDE
520	SCALE,CR
521	EXTENSION SPRING,3.289
522	PAPER GUIDE,FRONT,SUPPORT
523	INK SYSTEM ASSY.
524	MOTOR,ASSY.,PF
525	ROLLER,PF ASSY.
527	PAPER GUIDE,FRONT ASSY.

Code	Parts Name
528	HOLDER,SHAFT ASSY.
529	TORSION SPRING,0.22
530	BOARD ASSY.,DETECTOR
531	CR SUB ASSY.
532	CABLE,HEAD
533	BOARD ASSY.,ENCODER
534	BOARD ASSY.,DETECTOR,PW
535	MOTOR ASSY.,CR
536	DETECTOR ASSY.,PG
537	PRINT HEAD
538	CLAMP,TUBE
539	LEVER,PG;EPG2
540	POROUS PAD,JOINT,LOWER
541	TUBE,INK EJECT
542	JOINT,INK EJECT;B
543	MOUNTING PLATE,LEVER,PG
554	COMPRESSION SPRING,2.51
555	EXTENSION SPRING,0.143
556	TORSION SPRING,6.45
557	SHAFT,CR GUIDE
561	POROUS PAD,INK EJECT,7;B
562	POROUS PAD,INK EJECT,8;B
563	POROUS PAD,INK EJECT,6;B
564	POROUS PAD,INK EJECT,5;B
565	POROUS PAD,INK EJECT,3;B
566	DIFFUSION SHEET,INK EJECT,ASP
567	POROUS PAD,INK EJECT,4;B
NON FIG	PLANE WASHER,2.6X0.5X8
NON FIG	COMPRESSION SPRING,5.1

Code	Parts Name
NON FIG	SPACER,4.1X0.5,L/NA
NON FIG	TORSION SPRING,LEVER,CARTRIDGE;B
NON FIG	SPUR GEAR,30.8
NON FIG	INK CART.UNBOXED,BK-S,PIG'T;G38C,WST,AS
NON FIG	INK CART.UNBOXED,C-S,PIG'T;G38C,WST,AS
NON FIG	INK CART.UNBOXED,M-S,PIG'T;G38C,WST,AS
NON FIG	INK CART.UNBOXED,Y-S,PIG'T;G38C,WST,AS

☐   Parts list for EPSON Stylus CX4100/CX4200/DX4200

Code	Parts Name
100	COVER,ASF
101	COVER,REAR;EDG2
102	COVER,USB;EDG2
105	PAPER SUPPORT ASSY.
106	HOUSING,UPPER,EDG2
108	STACKER ASSY.;EDG2
111	FOOT
112	LOCK,STACKER
113	HOUSING,LOWER,EDG2
115	BUTTON,INK;B;ENB7
116	BUTTON,COPY;B;ENB7
117	BUTTON,POWER;B;ENB7
118	BUTTON,S;ENB7
119	BUTTON,STOP;ENB7
121	DECORATION PLATE,H.PANEL;EBM;TEXT;LTR
122	HOUSING,PANEL;C
124	COVER,LED
125	OPTICAL TUBE,PANEL,LOWER
450	BOARD ASSY.,PANEL
809	HINGE,ASSY.
811	HINGE,L
812	SCANNER ASSY.;EDG2
813	COVER,DOCUMENT ASSY.,CX4100
NON FIG	LABEL,INK,POSITION
200	MAIN BOARD ASSY.
300	POWER SUPPLY UNIT;100V
500	PRINTER MECHANISM(ASP)MAO10-102
501	FRAME,FRONT;B

Code	Parts Name
502	COVER,CABLE,HEAD
503	COVER,CARTRIDGE;EPG2
504	FRAME,HOLDER,FFC
505	SCALE,PF;B
506	POROUS PAD,CAP,LOWER
508	GUIDE,FFC
510	ASF UNIT;B
512	CONNECTER,CSIC
513	BOARD ASSY.,CSIC
514	GROUNDING SPRING,PF
515	FRAME,GUIDE,CR
516	LEVER,PARALLEL ADJUSTMENT,RIGHT
517	LEVER,PARALLEL ADJUSTMENT,LEFT
518	TORSION SPRING,SHAFT,CR,GUIDE
519	PRESSING SPRING,SHAFT,CR,GUIDE
520	SCALE,CR
521	EXTENSION SPRING,3.289
522	PAPER GUIDE,FRONT,SUPPORT
523	INK SYSTEM ASSY.
524	MOTOR,ASSY.,PF
525	ROLLER,PF ASSY.
526	PAPER GUIDE,UPPER ASSY.
527	PAPER GUIDE,FRONT ASSY.
528	HOLDER,SHAFT ASSY.
529	TORSION SPRING,0.22
530	BOARD ASSY.,DETECTOR
531	CR SUB ASSY.
532	CABLE,HEAD
533	BOARD ASSY.,ENCODER

Code	Parts Name
534	BOARD ASSY.,DETECTOR,PW
535	MOTOR ASSY.,CR
536	DETECTOR ASSY.,PG
537	PRINT HEAD
538	CLAMP,TUBE
539	LEVER,PG;EPG2
540	POROUS PAD,JOINT,LOWER
541	TUBE,INK EJECT
542	JOINT,INK EJECT;B
543	MOUNTING PLATE,LEVER,PG
554	COMPRESSION SPRING,2.51
555	EXTENSION SPRING,0.143
556	TORSION SPRING,6.45
557	SHAFT,CR GUIDE
561	POROUS PAD,INK EJECT,7;B
562	POROUS PAD,INK EJECT,8;B
563	POROUS PAD,INK EJECT,6;B
564	POROUS PAD,INK EJECT,5;B
565	POROUS PAD,INK EJECT,3;B
566	DIFFUSION SHEET,INK EJECT,ASP
567	POROUS PAD,INK EJECT,4;B
NON FIG	PLANE WASHER,2.6X0.5X8
NON FIG	COMPRESSION SPRING,5.1
NON FIG	SPACER,4.1X0.5,L/NA
NON FIG	TORSION SPRING,LEVER,CARTRIDGE;B
NON FIG	SPUR GEAR,30.8
NON FIG	COVER,INK EJECT
NON FIG	INK CART.UNBOXED,BK-S,PIG'T;G38C,WST,AS

Code	Parts Name
NON FIG	INK CART.UNBOXED,C-S,PIG'T;G38C,WST,AS
NON FIG	INK CART.UNBOXED,M-S,PIG'T;G38C,WST,AS
NON FIG	INK CART.UNBOXED,Y-S,PIG'T;G38C,WST,AS

7.4 Electrical Circuits

The electric circuit diagrams below are shown at the following pages:

☐   C610 Main control circuit board

☐   C610 PSB/PSE power supply circuit board

☐   C571/C577 Panel circuit board

☐   C610 I/F
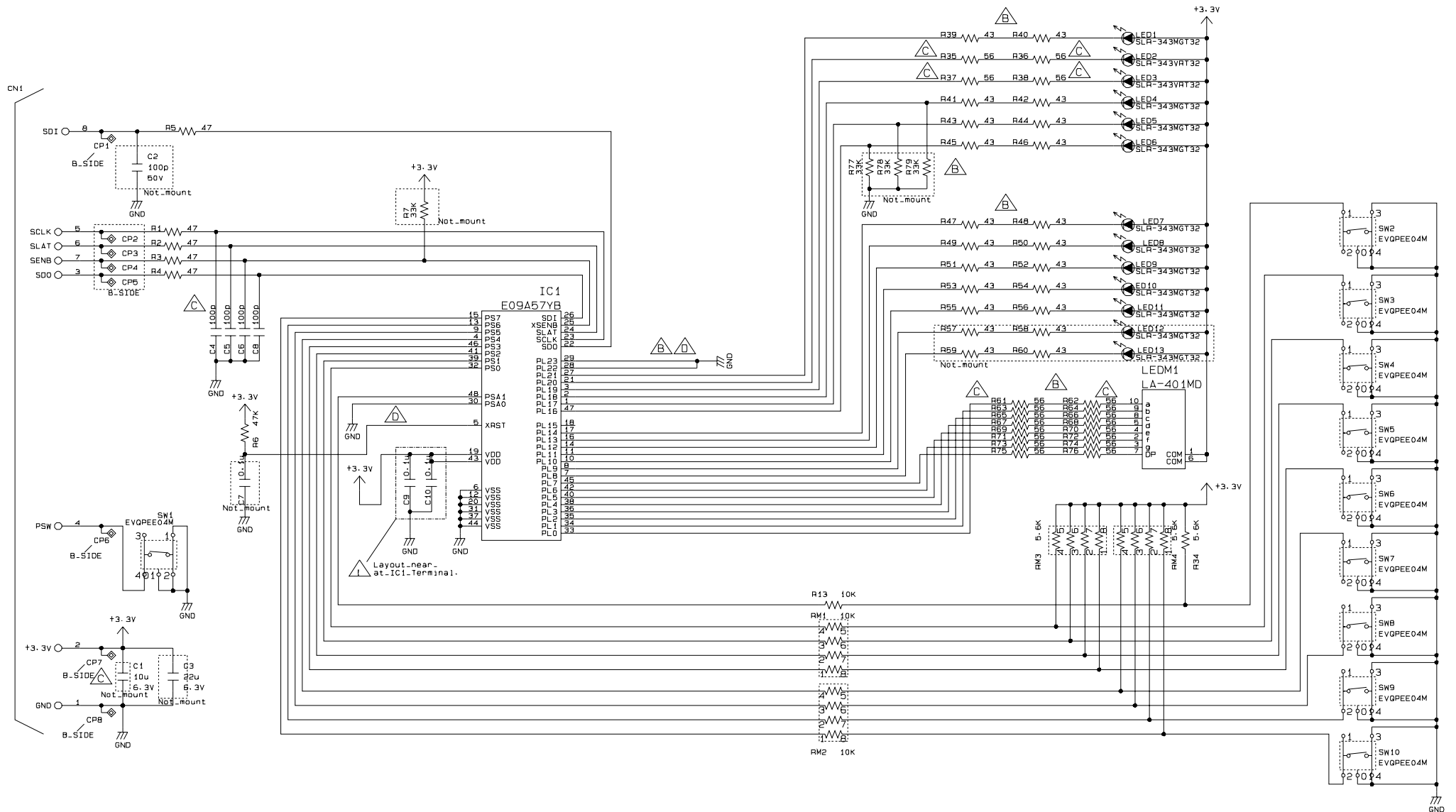
Model : PX-A650, Stylus CX4700/CX4800/DX4800/
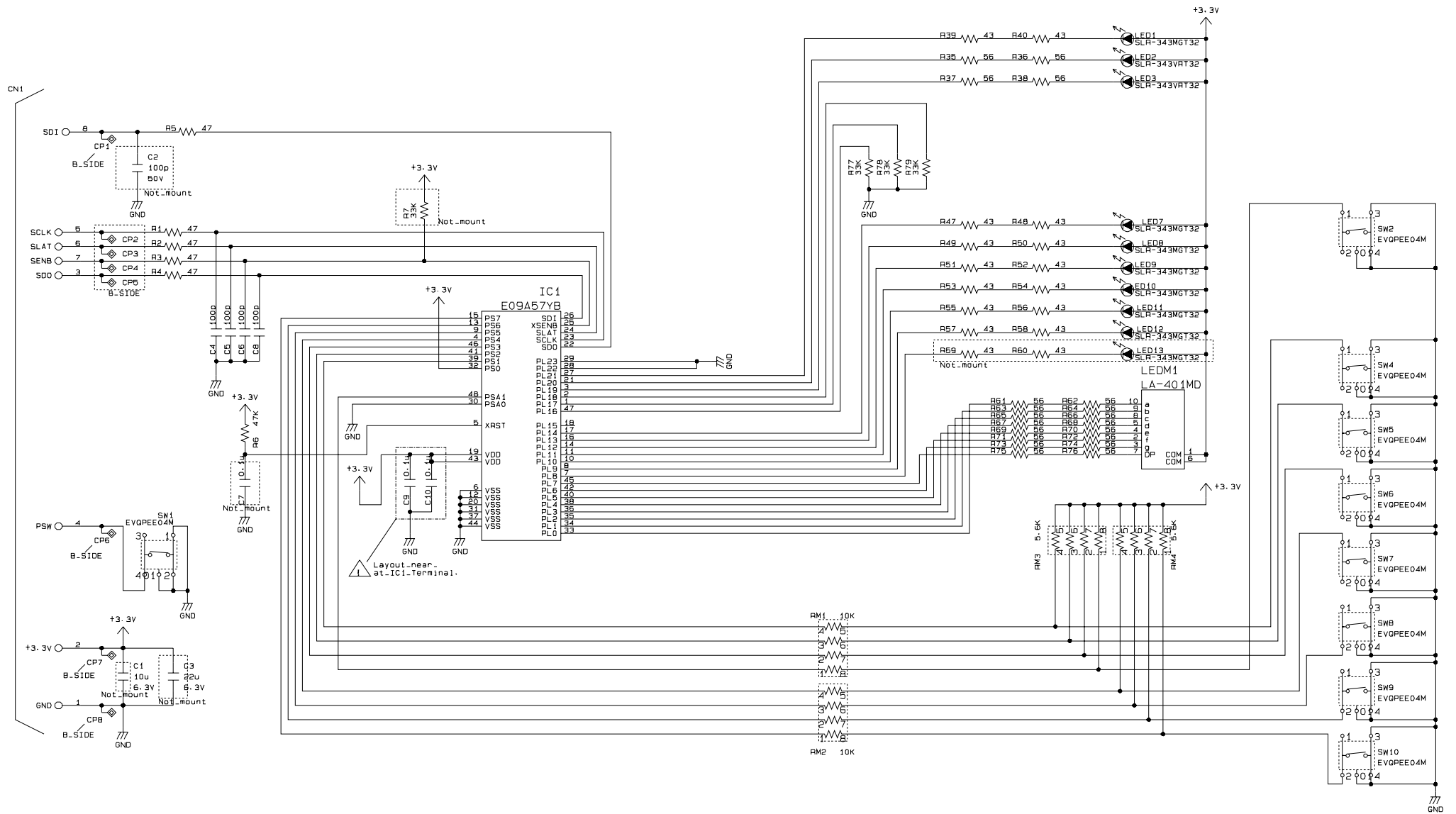DX4850/CX4100/CX4200/DX4200
Board : C610 MAIN
Rev. : C
Sheet : 1/2

CIS I/F

PANEL I/F

SCN HP SENSOR

Model : PX-A650, Stylus CX4700/CX4800/DX4800/
        DX4850/CX4100/CX4200/DX4200
Board : C610 MAIN
Rev. : A
Sheet : 2/2

Model : PX-A650, Stylus CX4700/CX4800/DX4800/
DX4850/CX4100/CX4200/DX4200
Board : C610 PSB
Rev. : B
Sheet : 1/1
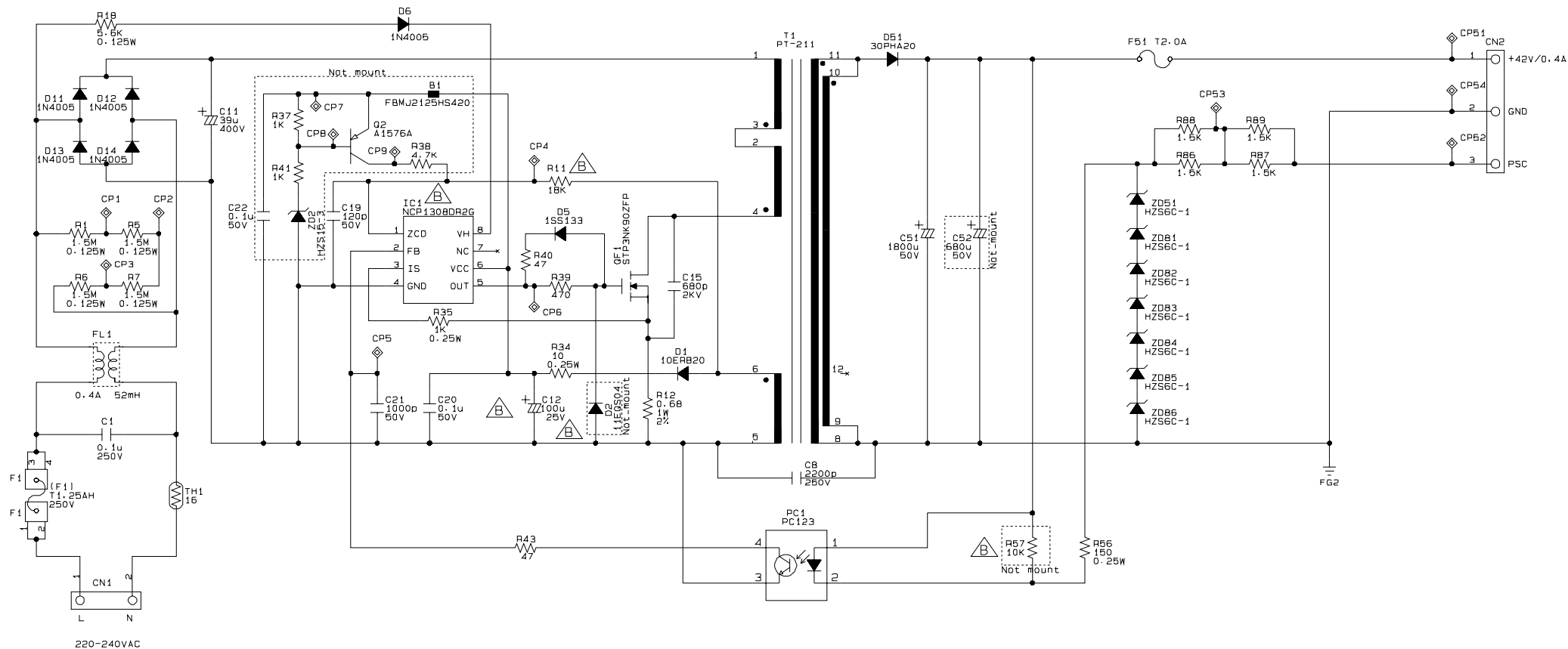
Model : PX-A650, Stylus CX4700/CX4800/DX4800/
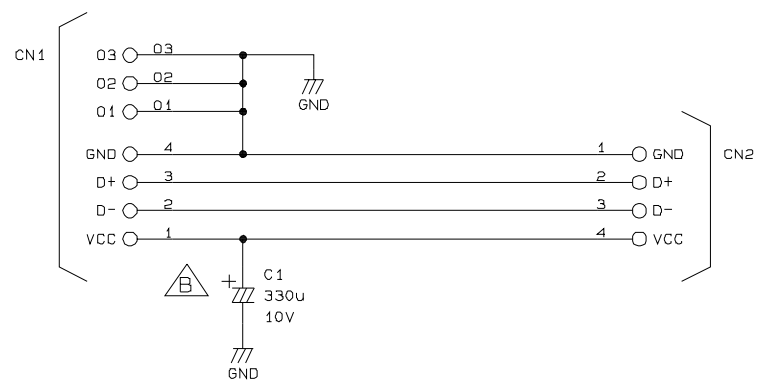DX4850/CX4100/CX4200/DX4200
Board : C610 PSE
Rev. : B
Sheet : 1/1

Model : PX-A650, Stylus CX4700/CX4800/DX4800/
DX4850
Board : C571 PNL
Rev. : D
Sheet : 1/1

Model : Stylus CX4100/CX4200/DX4200
Board : C577 PNL
Rev. : A
Sheet : 1/1

CN1

O3 O3
O2 O2
O1 O1
GND 4
D+ 3
D- 2
VCC 1

GND

B

+ C1
330u
10V

GND

1 GND CN2
2 D+
3 D-
4 VCC

Model : PX-A650, Stylus CX4700/CX4800/DX4800/
DX4850/CX4100/CX4200/DX4200
Board : C610 I/F
Rev. : B
Sheet : 1/1